HVAC PIPING LEGEND

SYMBOL	DESCRIPTION
G	GAS - LOW PRESSURE
MPG	GAS - MEDIUM PRESSURE
HPG	GAS - HIGH PRESSURE
LPG	GAS - LIQUIFIED PETROLEUM
A	COMPRESSED AIR
V	VACUUM
O	OXYGEN
HWS	HOT WATER SUPPLY, HEATING
HWR	HOT WATER RETURN, HEATING
CHS	CHILLED WATER SUPPLY
CHR	CHILLED WATER RETURN
HCS	HOT-CHILLED SUPPLY
HCR	HOT CHILLED RETURN
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
S100	STEAM (NO. INDICATES PRESSURE)
C100	CONDENSATE RETURN (NO. INDICATES PRESSURE OF SUPPLY)
CPD	CONDENSATE PUMP DISCHARGE
BFW	BOILER FEED WATER
BD	BLOW DOWN
FOS	FUEL OIL SUPPLY
FOR	FUEL OIL RETURN
HTS	HEAT TRANSFER SUPPLY
HTR	HEAT TRANSFER RETURN
RD	REFRIGERANT DISCHARGE
RS	REFRIGERANT SUCTION
RL	REFRIGERANT LIQUID
R	REFRIGERANT LINE SET
CD	CONDENSATE DRAIN LINE
	BALL VALVE
	BUTTERFLY VALVE
	CHECK VALVE
	GATE VALVE
	GATE VALVE (MANUAL)
	GLOBE VALVE
	MOTORIZED (SOLENOID) VALVE
	OS&Y GLOBE
	RELIEF VALVE
	STRAINER
	TEMPERATURE CONTROL VALVE
	UNION
	FLOW DIRECTION
	THERMAL EXPANSION LOOP
	PIPE ANCHOR
	CLEANOUT
	EXISTING PIPING
	EXISTING PIPING TO BE REMOVED

HVAC GENERAL, DUCTWORK, AND CONTROLS LEGEND

SYMBOL	DESCRIPTION
OR	SUPPLY AIR DEVICE
OR	RETURN AIR DEVICE
OR	EXHAUST AIR DEVICE
	SIDEWALL GRILLE
	SIDEWALL TRANSFER GRILLE
	DOOR TRANSFER GRILLE
	SLOT DIFFUSER
	ROUND DIFFUSER
	SUPPLY UP
	RETURN UP
	EXHAUST UP
	SUPPLY DOWN
	RETURN DOWN
	EXHAUST DOWN
	ROUND UP
	ROUND DOWN
	ROUND DUCT BREAK
	RECTANGULAR DUCT BREAK
	OPPOSED BLADE DAMPER
	PARALLEL BLADE DAMPER
	MANUAL DAMPER
M	MOTORIZED, OPPOSED BLADE DAMPER
	FLEXIBLE CONNECTION
	LINED DUCT
	90° ELBOW W/ TURNING VANE
F / S	FIRE DAMPER, SMOKE DAMPER
FS	COMBINATION FIRE/SMOKE DAMPER

SYMBOL	DESCRIPTION
S.D.	SPLITTER DAMPER AT BRANCH OFF
S.D.	SPLITTER DAMPER AT TEE
	BULL HEAD TEE W/ TURNING VANES & DAMPERS
FLOW	TAKE OFF W/ EXTRACTOR & MANUAL DAMPER
TOP / SIDE / 30° OR LESS	RECTANGULAR TRANSITION
	90° BEND, ROUND DUCT
	45° BEND, ROUND DUCT
	45° RECTANGULAR DUCT
	EXISTING DUCTWORK OR EQUIPMENT
	EXISTING DUCTWORK OR EQUIPMENT TO BE REMOVED
SD	DUCT SMOKE DETECTOR
T	THERMOSTAT
T	THERMOSTAT W/LOCKING COVER
TS	TEMPERATURE SENSOR
T	REMOTE THERMOSTAT
H	HUMIDISTAT
C	CARBON DIOXIDE SENSOR
CO	CARBON MONOXIDE SENSOR
P	DUCT PRESSURE SENSOR
$	WALL SWITCH MOUNTED WITHIN 48" A.F.F.
	CONNECT TO EXISTING AT THIS POINT
	POINT OF DEMOLITION
X	KEY NOTE
1	REVISION SYMBOL
A 8 CFM / B 22/22 CFM	DIFFUSER CALL-OUT = ID PER SCHEDULE / NECK SIZE over DIFFUSER CFM
VAV ID	AIR TERMINAL CALL-OUT = AIR TERMINAL DESIGNATION over ID PER SCHEDULE

HVAC GENERAL NOTES

1. ALL WORK SHALL COMPLY WITH THE MARCH 2011 EDITION OF THE "HVAC DESIGN MANUAL FOR NEW REPLACEMENT AND RENOVATION OF EXISTING VA FACILITIES.
2. REFER TO THE PROJECT MANUAL FOR REQUIREMENTS.
3. REFER TO ARCHITECTURAL PLANS FOR:
   - REFLECTED CEILING PLAN FOR EXACT LOCATION OF AIR DEVICES AND CEILING TYPES.
   - EXACT LOCATIONS AND MOUNTING HEIGHTS OF EXTERIOR LOUVERS.
   - FIRE RATED WALLS AND PARTITIONS. PROVIDE FIRE DAMPERS IN DUCT PENETRATIONS OF ALL FIRE RATED WALLS AND PARTITIONS AS NECESSARY TO MEET CITY AND STATE REQUIREMENTS.
   - ALL WALL AND ROOF PENETRATIONS AND EQUIPMENT MOUNTING DETAILS.
3. ALL DUCT DIMENSIONS REPRESENT AIRFLOW AREA. INCREASE DUCT DIMENSIONS AS REQUIRED WHERE INTERNAL LINER IS SPECIFIED.
4. RUN-OUTS TO AIR DEVICES SHALL BE FULL AIR DEVICE CONNECTION SIZE UNLESS OTHER WISE NOTED.
5. ALL DUCTWORK SHALL BE CONSTRUCTED FROM GALVANIZED STEEL IN CONFORMANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS," LATEST EDITION.
6. U.L. LISTED FLEXIBLE DUCT RUN-OUTS MAY BE USED, BUT SHALL NOT EXCEED 6'-0" IN LENGTH. ALL FLEXIBLE DUCT TO BE PROPERLY SUPPORTED WITH NO KINKS OR HARD BENDS.
7. DUCT FITTINGS:
   - SUPPLY TAKE-OFFS TO CEILING SUPPLY DIFFUSERS TO BE CONICAL TAP.
   - ALL DUCT RUN-OUTS TO HAVE LOCKING QUADRANT VOLUME DAMPERS
   - ALL 90° ROUND ELBOWS TO HAVE R/D=1.5 (UNLESS OTHERWISE NOTED).
   - ALL 90° RECTANGULAR ELBOWS TO HAVE TURNING VANES (UNLESS OTHERWISE NOTED).
   - PROVIDE HARD ELBOW WHEN TRANSITIONING FROM RIGID TO FLEXIBLE DUCT WHEN CONNECTING TO AIR DEVICES. REFER TO DETAIL.
7. WHERE MANUAL DAMPERS ARE INSULATED IN EXTERNALLY INSULATED DUCTWORK, PROVIDE 2" STAND-OFF BRACKET WITH QUADRANT INDICATOR TO PREVENT COMPRESSION OF INSULATION BY DAMPER OPERATOR HANDLE.
8. ALL EXTERIOR EXPOSED DUCT SHALL HAVE CONTINUOUS ALUMINUM JACKETS AND ALL JOINTS AND SEAMS SHALL BE SEALED WITH WATERPROOF SEALANT. INSTALL METAL JACKETS WITH 2" OVERLAP AT LONGITUDINAL AND BUTT JOINTS. OVERLAP LONGITUDINAL JOINTS TO SHED WATER. SEAL BUTT JOINTS WITH WEATHERPROOF SEALANT RECOMMENDED BY INSULATION MANUFACTURER. SECURE JACKET WITH STAINLESS-STEEL DRAW BANDS 12" O.C. AND AT BUTT JOINTS.
9. DUCTWORK TO BE COORDINATED WITH STRUCTURAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION, COMPONENTS AND SYSTEMS. ALL DUCTWORK THAT HAS TO BE OFFSET DUE TO AN OBSTRUCTION SHALL BE SLOPED WITH 2-45° ELBOWS UNLESS OTHERWISE NOTED.
10. PROVIDE ACCESS PANELS IN CEILINGS OTHER THAN LAY-IN TYPE WHERE NECESSARY:
    - PROVIDE 24"x24" ACCESS PANEL AT BALANCING DAMPERS, FIRE DAMPERS, CONTROLS, VALVES, TRAPS, CLEAN OUTS, ETC.
    - CLOSELY COORDINATE LOCATIONS AND SIZE OF ACCESS PANELS WITH INSTALLED EQUIPMENT TO ACHIEVE GREATEST ACCESSIBILITY FOR MAINTENANCE PURPOSES.
    - PROVIDE 36"x24" ACCESS PANEL FOR EACH HEAT PUMP.
    - PROVIDE ACCESS PANELS FOR GREASE DUCTS, AS REQUIRED BY NFPA 96, AT CHANGES IN DIRECTION, ETC.
11. COMPLETELY INSULATE THE TOPS OF ALL CEILING DIFFUSERS.
12. CLOSELY COORDINATE LOCATIONS OF INSTALLED EQUIPMENT TO ACHIEVE THE GREATEST ACCESSIBILITY.
13. MAINTAIN 25'-0" MINIMUM CLEARANCE BETWEEN OUTSIDE AIR INTAKES AND ALL EXHAUST FANS, FLUES, PLUMBING VENTS, ETC.
14. ALL ROOF MOUNTED HVAC EQUIPMENT, INCLUDING BUT NOT LIMITED TO EXHAUST FANS, CONDENSING UNITS, AND ROOF-TOP UNITS, SHALL BE A MINIMUM OF 10' FROM THE ROOF'S EDGE, OR PARAPET, UNLESS OTHERWISE NOTED ON PLANS. IN SUCH CASE, CONTRACTOR SHALL COORDINATE WITH ARCHITECT TO PROVIDE SAFETY HANDRAILS AROUND ROOF MOUNTED HVAC EQUIPMENT THAT IS LOCATED LESS THAN 10' FROM ROOF'S EDGE, OR PARAPET.
15. PROVIDE FLEXIBLE CONNECTIONS AT INLETS AND OUTLETS OF ALL AIR HANDLING UNITS, MAKE-UP AIR UNITS, FURNACES, AND/OR EXHAUST FANS.
16. SUPPORT ALL REFRIGERANT AND CONDENSATE PIPING ON ROOF PER DETAIL.
17. CONDENSATE PIPING SHALL BE COMPRISED OF TYPE "M", DWV COPPER, OR SCHEDULE 40 PVC.
18. ALL EXTERIOR EXPOSED PIPING SUSCEPTIBLE TO FREEZING, SUCH AS CONDENSATE PIPING, SHALL BE INSULATED WITH 1" FIBERGLASS PIPING INSULATION WITH 0.020" ALUMINUM JACKET AND HEAT TRACED AT 5 WATTS/FOOT. SEAL JACKET WATER-TIGHT.
19. FOR EACH ROOFTOP UNIT, CONDENSATE PIPE ROUTED ALONG THE ROOF (AND SUPPORTED ABOVE ROOF) SHALL SPILL INTO NEAREST ROOF DRAIN, OR GUTTER. SPILLING CONDENSATE ONTO THE ROOF SURFACE IS UNACCEPTABLE.
20. REFER TO SEQUENCE OF OPERATIONS FOR ALL EQUIPMENT OPERATION CYCLES.
21. ALL WALL MOUNTED HVAC EQUIPMENT, OCCUPANT CONTROLLED HVAC DEVICES, I.E., THERMOSTATS, CO2 CONTROLLERS, CONTROL PANELS, ETC., BE MOUNTED 4'-0 ABOVE FINISHED FLOOR. CONTROLS LOCATED IN PUBLIC AREAS SHALL HAVE CLEAR PLASTIC LOCKING COVERS. CONTROLS LOCATED IN AREAS WHERE DAMAGE MAY OCCUR, I.E., MECHANICAL ROOMS, SHOP AREAS, ETC., SHALL HAVE VENTED STEEL LOCKING COVERS AND SHALL BE PAINTED PER ARCHITECT.
22. COORDINATE WORK CLOSELY WITH CONTROL CONTRACTOR. PROVIDE ALL NECESSARY DUCT, PIPE TAPS, TEES, WELLS, CONTROL DAMPERS, AIR MEASURING STATIONS, AND OTHER ACCESSORIES REQUIRED BY CONTROL SYSTEM
23. A DUCT MOUNTED PHOTOELECTRONIC TYPE SMOKE DETECTOR SHALL BE MOUNTED IN THE SUPPLY AND RETURN DUCTS, BEFORE THE FIRST TAKEOFF. PROVIDE AN ACCESS DOOR AT EACH DETECTOR. UPON DETECTION OF SMOKE, THE DUCT SMOKE DETECTOR SHALL SHUT DOWN ITS ASSOCIATED AIR HANDLING UNIT AND PROVIDE A SIGNAL TO THE FIRE ALARM SYSTEM. SMOKE DETECTORS TO BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR AND MOUNTED BY THE MECHANICAL CONTRACTOR.
24. WHERE CONFLICTS OCCUR BETWEEN PLANS AND SPECIFICATIONS, VERIFY WITH ARCHITECT/ENGINEER FOR CLARIFICATIONS.
25. ALL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENTS OR GEOMETRIC RELATIONSHIPS OF EQUIPMENTS AND SERVICES. THEY ARE NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, FITTINGS, OR COMPONENT. CONTRACTOR SHALL NOT SCALE DRAWINGS. INFORMATION AND COMPONENTS SHOWN ON DIAGRAMS OR DETAIL, BUT NOT SHOWN ON PLANS, VIVE-VERSA, SHALL SUBMIT A REQUEST FOR INFORMATION (RFI) IF INFORMATION CONFLICTS. DRAWINGS SPECIFIC TO DISCIPLINE DO NOT LIMIT THE RESPONSIBILITY OF THE WORK REQUIRED BY CONTRACT DOCUMENTS. REFER TO ARCHITECTURAL, STRUCTURAL, ELECTRICAL, AND OTHER DRAWINGS FOR COMPLETE INFORMATION.

HVAC DEMOLITION / RENOVATION NOTES

1. CONTRACTOR SHALL VERIFY EXISTING SITE CONDITIONS INCLUDING, BUT NOT LIMITED TO:
   - PIPE SIZES AND ROUTING.
   - DUCT SIZES AND ROUTING.
   - EQUIPMENT CONNECTIONS AND LOCATIONS.
   - CONTROLS.
2. PROVIDE NECESSARY MODIFICATIONS TO NEW AND EXISTING SYSTEMS TO FACILITATE THE INSTALLATION OF NEW SYSTEMS AND INTERFACE OF EXISTING AND NEW SYSTEMS COMPLETE.EXISTING SYSTEMS AND INFORMATION SHOWN ON THESE PLANS WERE DEVELOPED USING EXISTING BUILDING DRAWINGS.
3. CONTRACTOR SHALL VERIFY AT SITE ALL EXISTING SYSTEMS. REMOVE ALL PORTIONS OF DUCT AND PIPING SYSTEMS BEING REMOVED OR ABANDONED. TERMINATE EXISTING SYSTEMS ABOVE CEILINGS AND BELOW FLOOR SLABS IN A MANNER THAT WILL NOT CONFLICT WITH NEW WORK. CLOSELY COORDINATE NEW WORK WITH EXISTING SYSTEMS. PROVIDE OFFSETS IN EXISTING AND NEW SYSTEMS AS REQUIRED TO AVOID CONFLICTS.
4. COORDINATE AND SCHEDULE ALL CONNECTIONS TO EXISTING SYSTEMS AND SYSTEM SHUT-DOWNS WITH MAINTENANCE PERSONNEL.
5. MAINTAIN EXISTING BUILDING SYSTEMS WITH PHASED DEMOLITION AND INSTALLATION OF NEW WORK, PROVIDING TEMPORARY SERVICES AS REQUIRED.
6. USE EXISTING PIPING SYSTEM VALVES WHERE POSSIBLE TO ISOLATE SYSTEMS AND TO CAP EXISTING PIPING. REPLACE EXISTING VALVES WHERE NECESSARY WHEN EXISTING VALVES WILL NOT HOLD.
7. EXISTING EQUIPMENT BEING REMOVED AND DESIGNATED TO REMAIN THE PROPERTY OF THE OWNER SHALL BE DELIVERED UPON REMOVAL TO LOCATION DESIGNATED BY OWNER. ALL OTHER SYSTEM COMPONENTS REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR.
8. REMOVE AND RELOCATE SMALL CONDUIT, CABLE, PIPE AND DUCT, PIPE AND CEILING HANGERS ETC. AS NECESSARY TO ACHIEVE A COMPLETE INSTALLED MECHANICAL SYSTEM AS SHOWN ON DRAWINGS.
9. PATCH ALL WALLS, FLOORS, ROOFS AND CEILINGS TO MATCH EXISTING OR NEW (IF APPLIED) FOR ALL OPENINGS CREATED BY DEMOLITION WORK OF EQUIPMENT AND HVAC SERVICE PENETRATIONS.
10. REPLACE AND/OR PATCH TO MATCH EXISTING; ANY EXISTING PIPE AND/OR DUCT INSULATION THAT IS TO REMAIN EXISTING AND IS DAMAGED OR REMOVED DURING CONSTRUCTION.
11. REFER TO PLUMBING AND ELECTRICAL PLANS FOR EXTENT OF DEMOLITION WORK RELATING TO GAS PIPING AND WIRING FOR SUPPORT OF HVAC EQUIPMENT TO BE REMOVED.

SEISMIC NOTES

SEISMIC (REFERENCE: ASCE 7-10)

SEISMIC IMPORTANCE FACTOR	Ie = 1.5
SPECTRAL RESPONSE COEFFICIENTS	Ss = 0.488 S1 = 0.180
SITE CLASS	C
ADJUSTED MCE SPECTRAL RESPONSE	Sms = 0.586 Sm1 = 0.292
DESIGN SPECTRAL RESPONSE ACCELERATION	SDS = 0.390 SD1 = 0.194
SEISMIC DESIGN CATEGORY	D
BASIC SEISMIC FORCE RESISTING SYSTEM	STEEL SPECIAL MOMENT FRAMES
DESIGN BASE SHEAR	V = 0.167w
SEISMIC RESPONSE COEFFICIENT	Cs = 0.167
RESPONSE MODIFICATION FACTOR	R = 3.5
ANALYSIS PROCEDURE	EQUIVALENT STATIC FORCE

CONSTRUCTION DOCUMENTS SUBMISSION
FULLY SPRINKLERED

Revisions: Date

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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9395 CHRISTOPHER R. BORNE 03/06/2015

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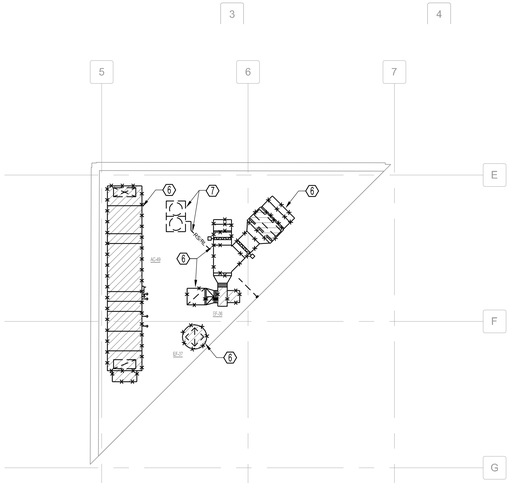
Drawing Title: MECHANICAL LEGEND & NOTES
Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**
Location: **LITTLE ROCK, ARKANSAS**
Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

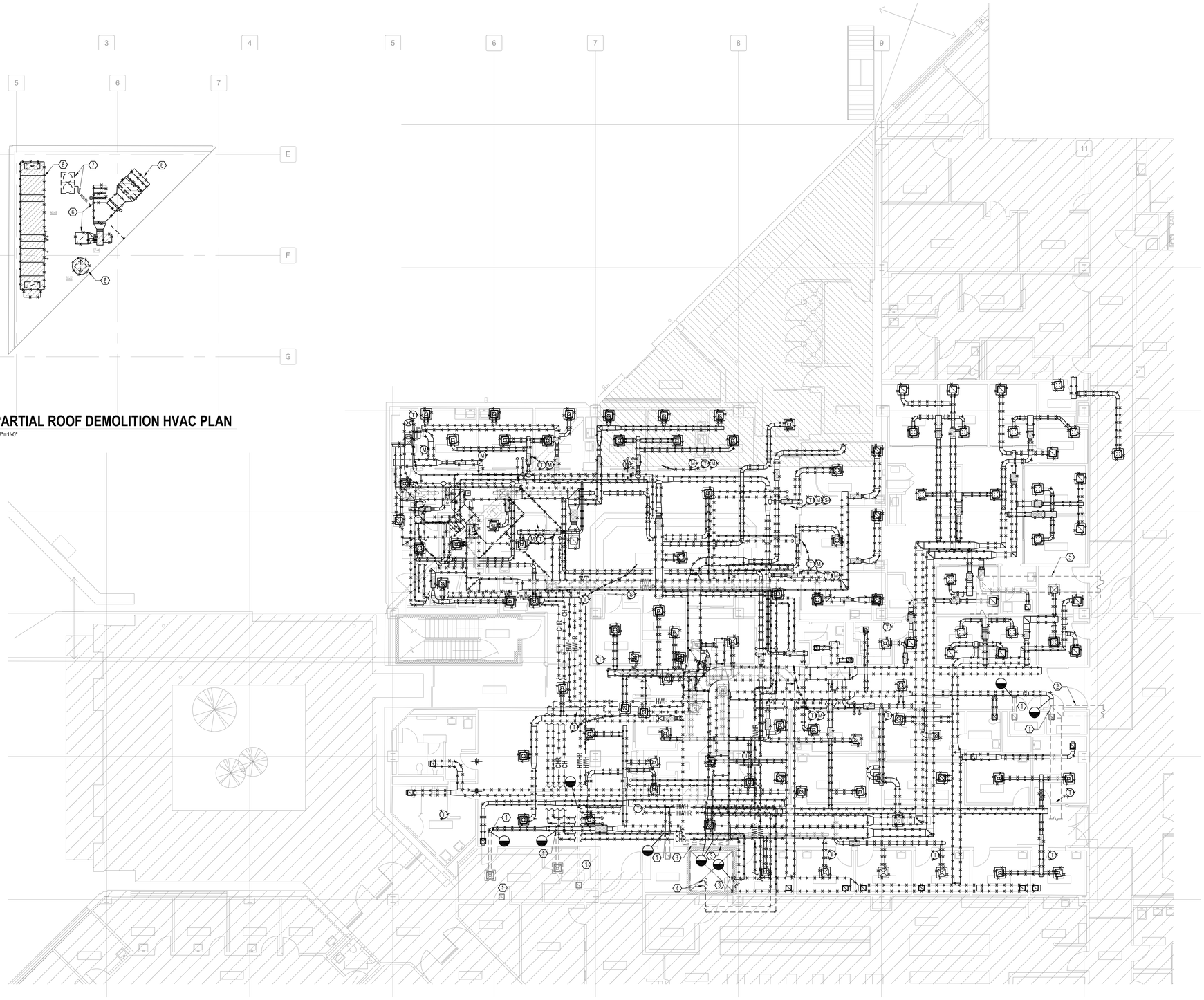
Project Number: **CSI-112**
Building Number: 1
Drawing Number: MI001
Dwg. **92** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM
Department of Veterans Affairs



2 PARTIAL ROOF DEMOLITION HVAC PLAN

1/8"=1'-0"



1 DEMOLITION HVAC PLAN

1/8"=1'-0"

GENERAL NOTES:

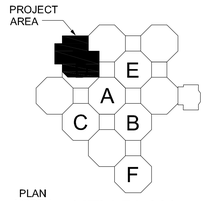
SEE SHEET MI001 FOR GENERAL NOTES

DEMOLITION KEY NOTES:

1. EXISTING BRANCH DUCTWORK AND AIR DEVICES TO REMAIN IN THESE ROOMS.
2. EXISTING 24/12 SUPPLY DUCT TO REMAIN.
3. EXISTING DUCT RISER TO REMAIN.
4. EXISTING 2" HWS/HWR AND 2½" CHS/CHR, IN CHASE SERVING THE EXISTING EMERGENCY DEPARTMENT, TO BE REMOVED UP THROUGH CHASE TO THIRD FLOOR MECHANICAL ROOM.
5. EXISTING 36/10 TO REMAIN.
6. REMOVE ALL EXISTING ROOFTOP EQUIPMENT (AC-49, EF-36 AND EF-37), DUCTWORK, PIPING, CONTROLS, ETC. IN THE AREA INDICATED
7. EXISTING VARIABLE REFRIGERANT FLOW (VRF) CONDENSING UNIT TO BE TEMPORARILY RE-LOCATED TO THE MECHANICAL ROOM BALCONY (THIRD FLOOR) RE-ROUTE REFRIGERANT PIPING AND POWER UP EXTERIOR WALL TO NEW LOCATION AS REQUIRED. UNIT SHALL BE MOVED BACK TO THE EDMH ROOF AT THE COMPLETION OF THE ADDITION.

GENERAL DEMOLITION NOTES:

1. DEMOLITION "X"s INDICATE ITEMS TO BE REMOVED.
2. REMOVE ALL DUCTWORK, PIPING, EQUIPMENT, CONTROLS, ETC. IN THIS AREA SERVING THE EXISTING EMERGENCY DEPARTMENT AS INDICATED.
3. THE CONTRACTOR SHALL RETURN ALL EXISTING HVAC EQUIPMENT, CONTROLS, ETC. (NOT SCHEDULED TO BE REUSED) TO OWNER.
4. CONTRACTOR SHALL REFERENCE ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION AND ELECTRICAL DRAWINGS AND/OR NOTES FOR COMPLETE DEMOLITION.



0 4' 8' 16'

SCALE: 1/8" = 1'-0"

PLAN NORTH

KEY PLAN

EDMH F.F.E.: 398.00'

PROJECT AREA: 17,075 S.F.

CONSTRUCTION DOCUMENTS SUBMISSION
FULLY SPRINKLERED

Revisions: Date

CONSULTANTS:

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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9395 CHRISTOPHER R. BORNÉ 03/06/2015

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Drawing Title: FIRST FLOOR AND ROOF HVAC DEMOLITION PLAN

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**

Building Number: 1

Drawing Number: MD101

Dwg. **93** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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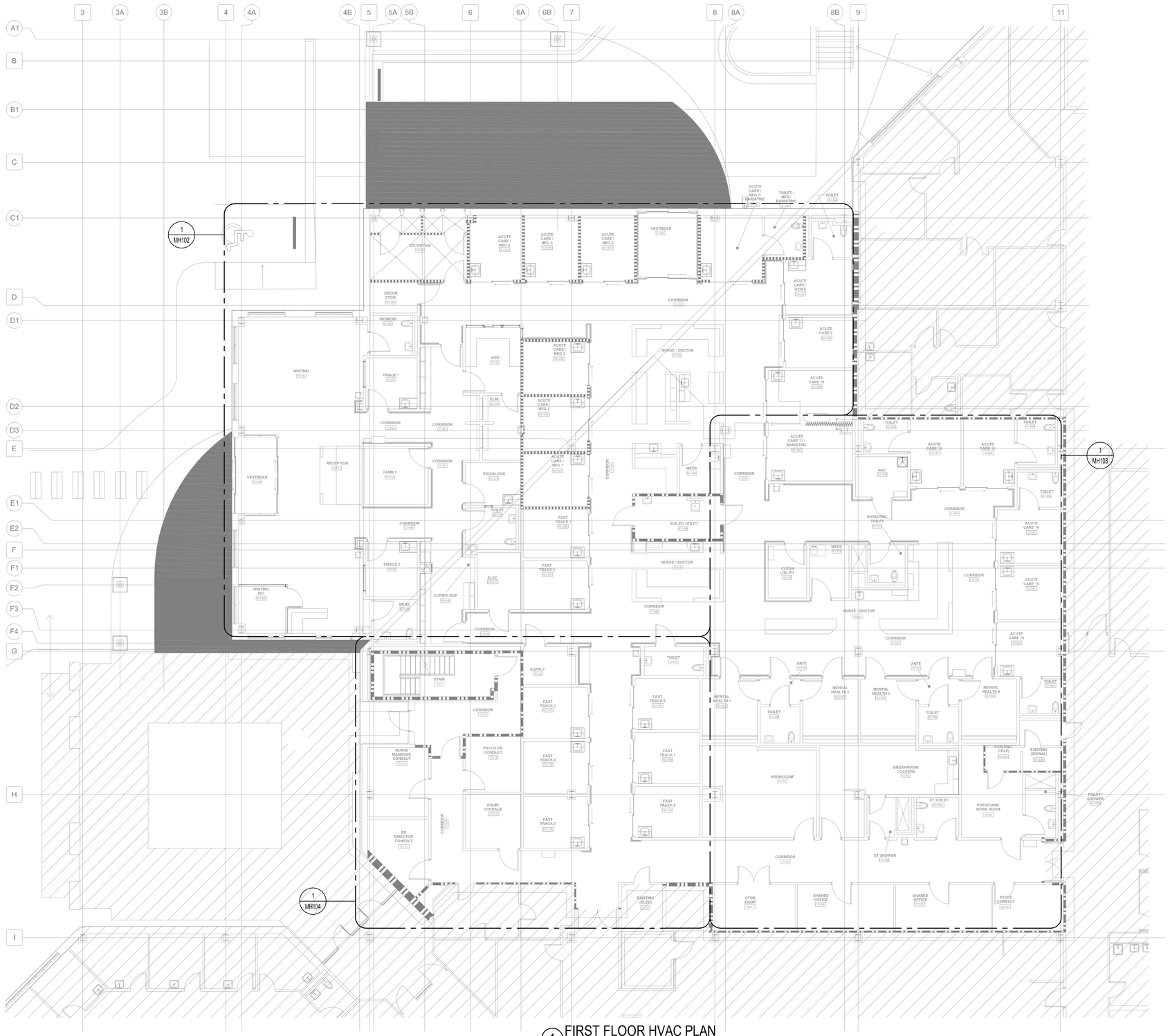
GENERAL NOTES:

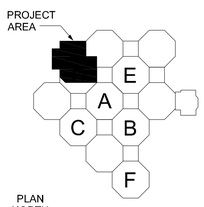
SEE SHEET MI001 FOR GENERAL NOTES

KEY NOTES:

1. NOT USED.



1 FIRST FLOOR HVAC PLAN
1/8"=1'-0"



0 4' 8' 16'
SCALE: 1/8" = 1'-0"

PLAN NORTH

KEY PLAN
EDMH F.F.E.: 398.00'
PROJECT AREA: 17,075 S.F.

CONSTRUCTION DOCUMENTS SUBMISSION
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03-06-2015

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Drawing Title: FIRST FLOOR HVAC PLAN

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**

Building Number: 1

Drawing Number: MH101

Dwg. **94** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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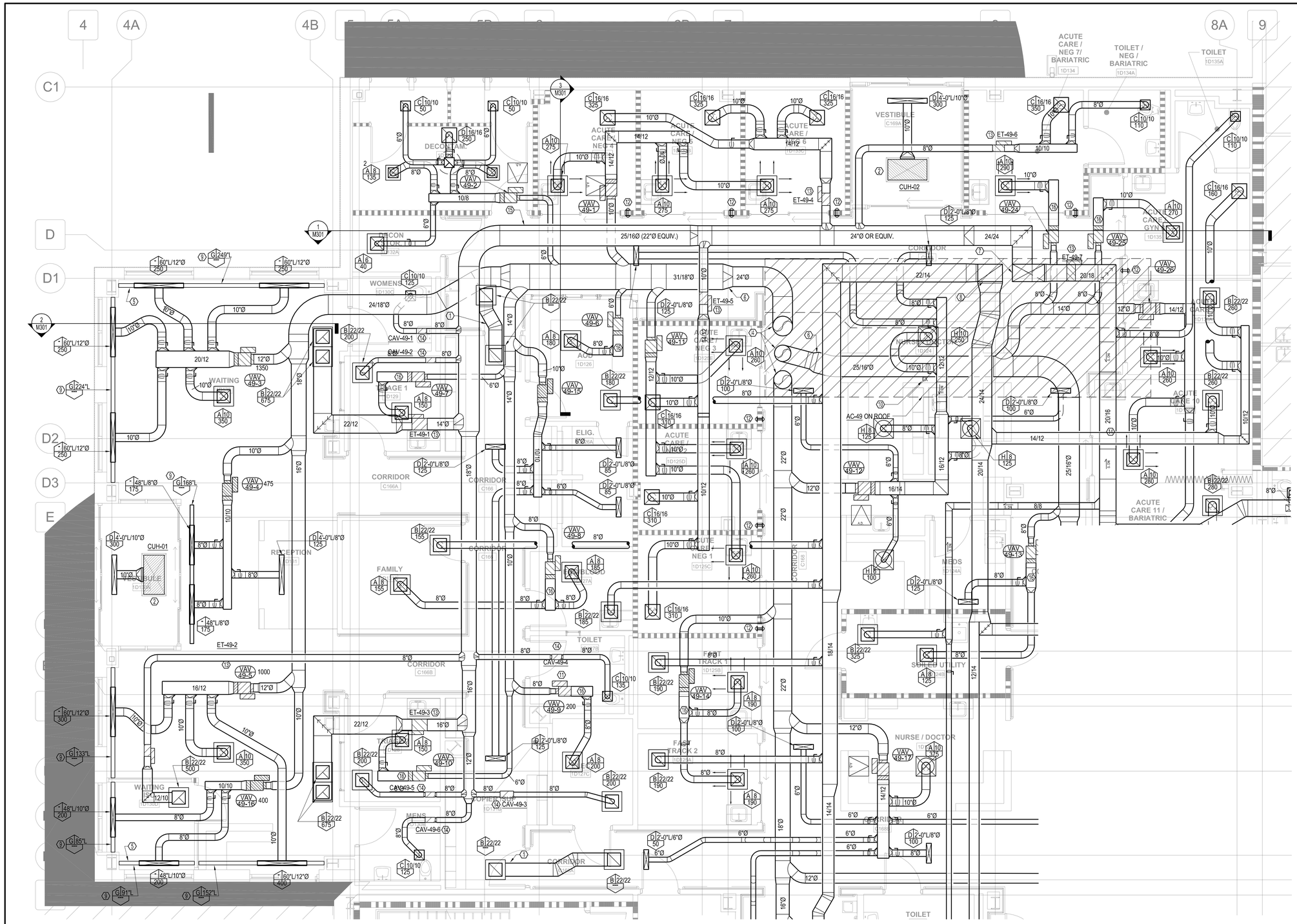


1 ENLARGED FIRST FLOOR HVAC PLAN
1/4"=1'-0"

SCALE: 1/4" = 1'-0"

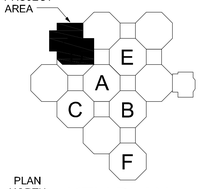
GENERAL NOTES:

SEE SHEET MI001 FOR GENERAL NOTES

KEY NOTES:

1. 20/12 TRANSFER DUCT.
2. RECESSED CABINET FAN COIL WITH CEILING PLATE, ELECTRIC HEAT, TRIM FLANGE MOUNT AND BOTTOM RETURN.
3. EXISTING AIR DEVICE.
4. ROUND SUPPLY UP TO BELL MOUTH AT AC-49.
5. CONTINUOUS SLOT DIFFUSER.
6. ECCENTRIC TRANSITION.
7. EXHAUST AIR UP.
8. RETURN AIR UP.
9. VERIFY EXACT LENGTH PROVIDE FLAT BLANK. BLANK-OFF OVER UNUSED PORTIONS OF SLOT DIFFUSER.
10. EMERGENCY 100% EXHAUST SWITCH.
11. COOLING ONLY VAV BOX.
12. VISUAL ONLY BALL-IN-WALL INDICATOR (NEGATIVE ROOM APPLICATION) EQUALTO AIRFLOW DIRECTION INC. MODEL ADI-69-V-N.
13. VAV EXHAUST TERMINAL.
14. CAV EXHAUST TERMINAL.
15. EXHAUST DUCT ABOVE (SHOWN DASHED FOR CLARITY).
16. SIZE DUCTWORK TO MATCH FULL VAV DISCHARGE SIZE.

(SEE FIRST FLOOR PLANS)
PROJECT AREA



PLAN NORTH

KEY PLAN

EDMH F.F.E.: 398.00'
PROJECT AREA: 17,075 S.F.

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

CONSTRUCTION DOCUMENTS SUBMISSION
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Revisions: | Date

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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9395 CHRISTOPHER R. BORNÉ
03/05/2015

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Drawing Title: ENLARGED FIRST FLOOR HVAC PLAN

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**
Building Number: 1
Drawing Number: MH102
Dwg. **95** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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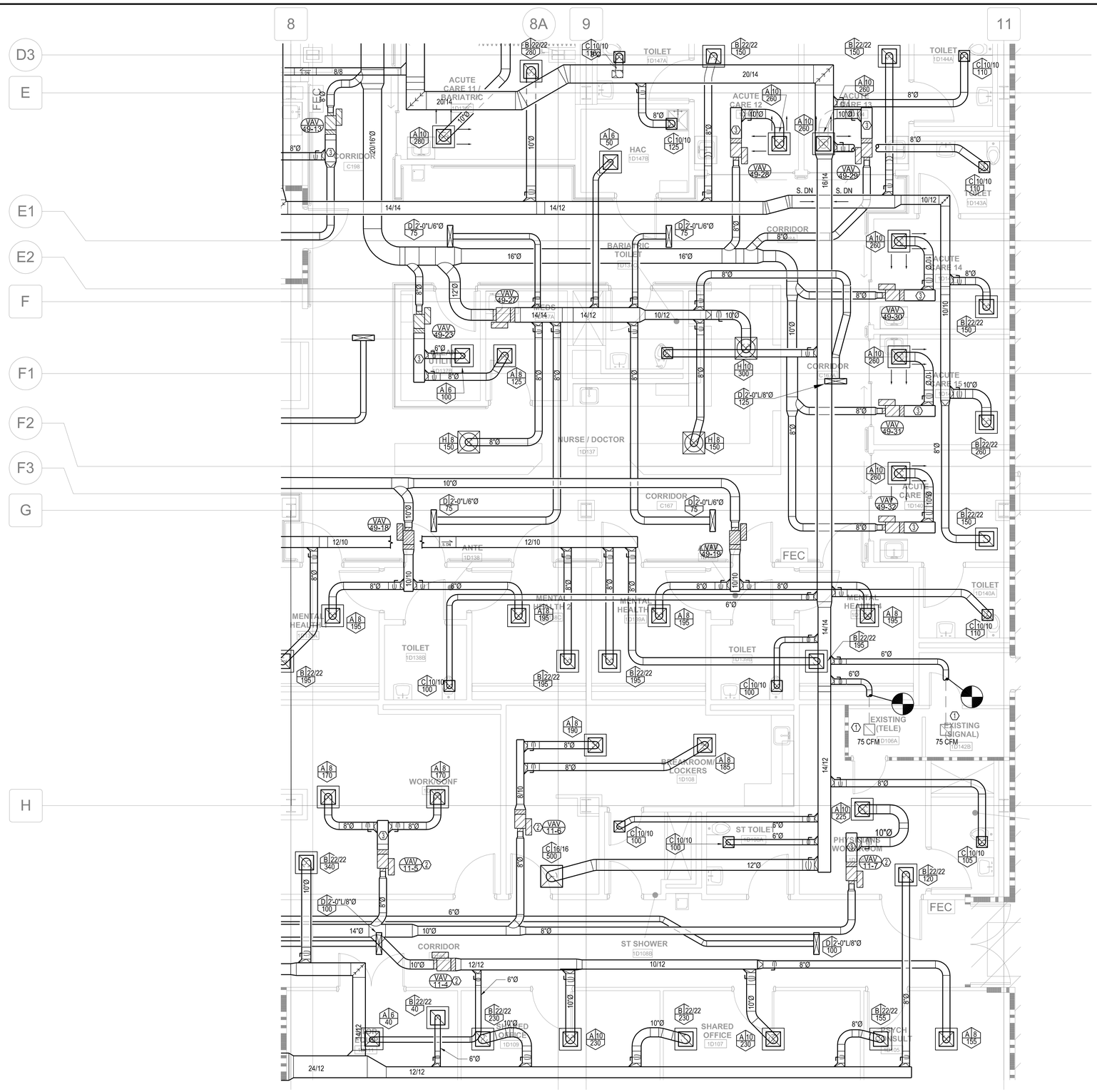


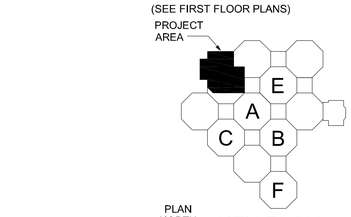
1 ENLARGED FIRST FLOOR HVAC PLAN

GENERAL NOTES:

SEE SHEET MI001 FOR GENERAL NOTES

KEY NOTES:

1. EXISTING AIR DEVICE.
2. THIS ZONE ON EXISTING AC-11 SYSTEM.
3. SIZE DUCTWORK TO MATCH FULL VAV DISCHARGE SIZE.



0 2' 4' 8'
SCALE: 1/4" = 1'-0"

PLAN NORTH

KEY PLAN

EDMH F.F.E.: 398.00'
PROJECT AREA: 17,075 S.F.

CONSTRUCTION DOCUMENTS SUBMISSION
FULLY SPRINKLERED

Revisions: | Date

CONSULTANTS:

CIVIL:
CROMWELL
101 SOUTH SPRING STREET
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MECHANICAL, PLUMBING, ELECTRICAL, FIRE PROTECTION:
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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9395 CHRISTOPHER B. BORNÉ
06/06/2015

ARCHITECT/ENGINEERS:

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BES DESIGN/BUILD, LLC
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Phone: 251.990.5778
Fax: 251.990.3716

Drawing Title: ENLARGED FIRST FLOOR HVAC PLAN

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**
Building Number: **1**
Drawing Number: MH103
Dwg. **96** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

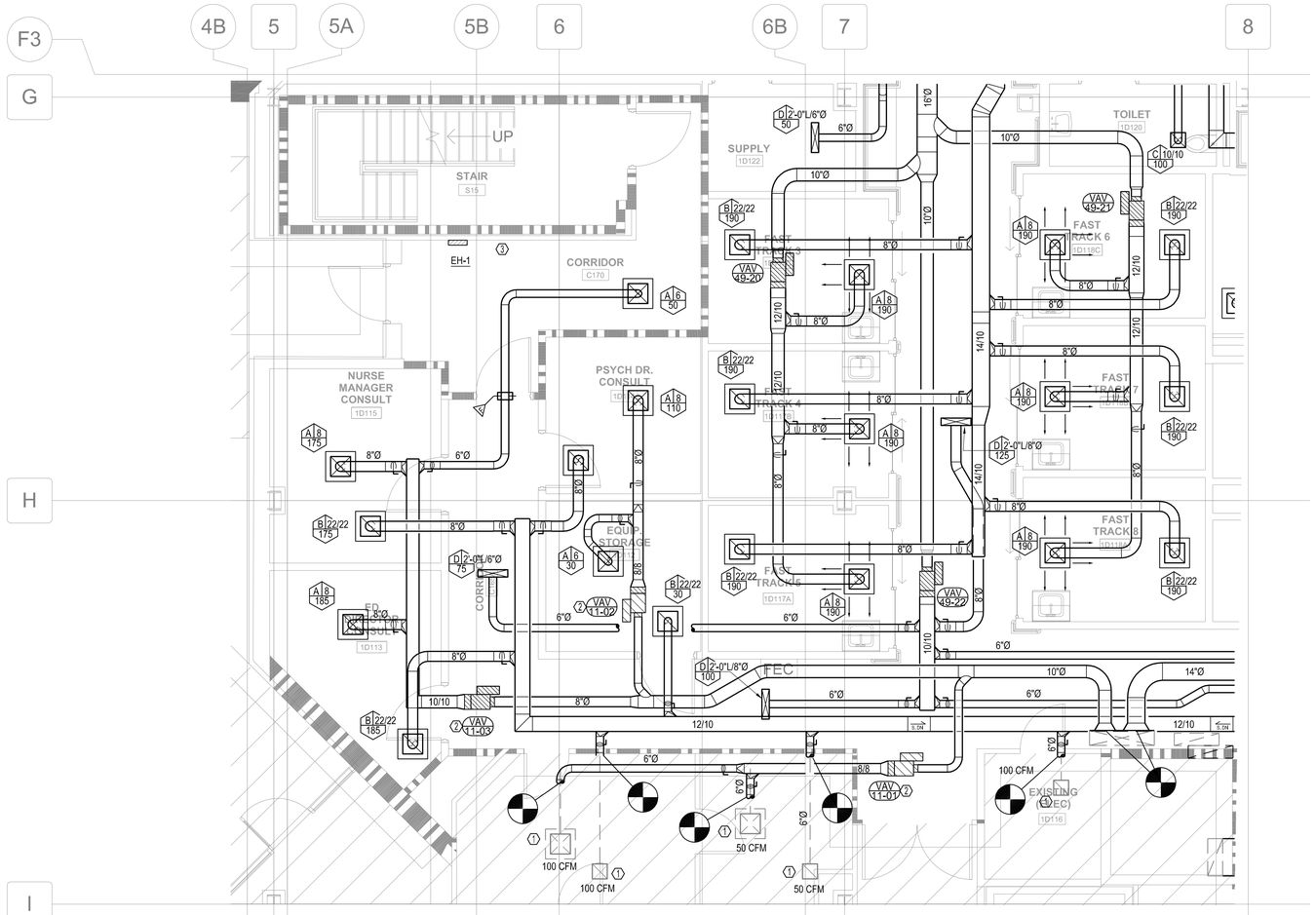
VA FORM 08-6231 8/28/2014 2:15:40 PM

GENERAL NOTES:

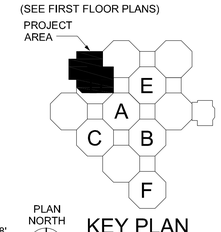
SEE SHEET MI001 FOR GENERAL NOTES

KEY NOTES:

1. EXISTING AIR DEVICE.
2. THIS ZONE ON EXISTING AC-11 SYSTEM.
3. WALL-MOUNTED ELECTRIC HEATER.



1 ENLARGED FIRST FLOOR PLAN
1/4"=1'-0"



PLAN NORTH

KEY PLAN

EDMH F.F.E.: 398.00'
PROJECT AREA: 17,075 S.F.

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

CONSTRUCTION DOCUMENTS SUBMISSION
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Revisions: Date

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Phone: 251.990.5778
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Drawing Title: ENLARGED FIRST FLOOR HVAC PLAN

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**
Building Number: 1
Drawing Number: MH104
Dwg. **97** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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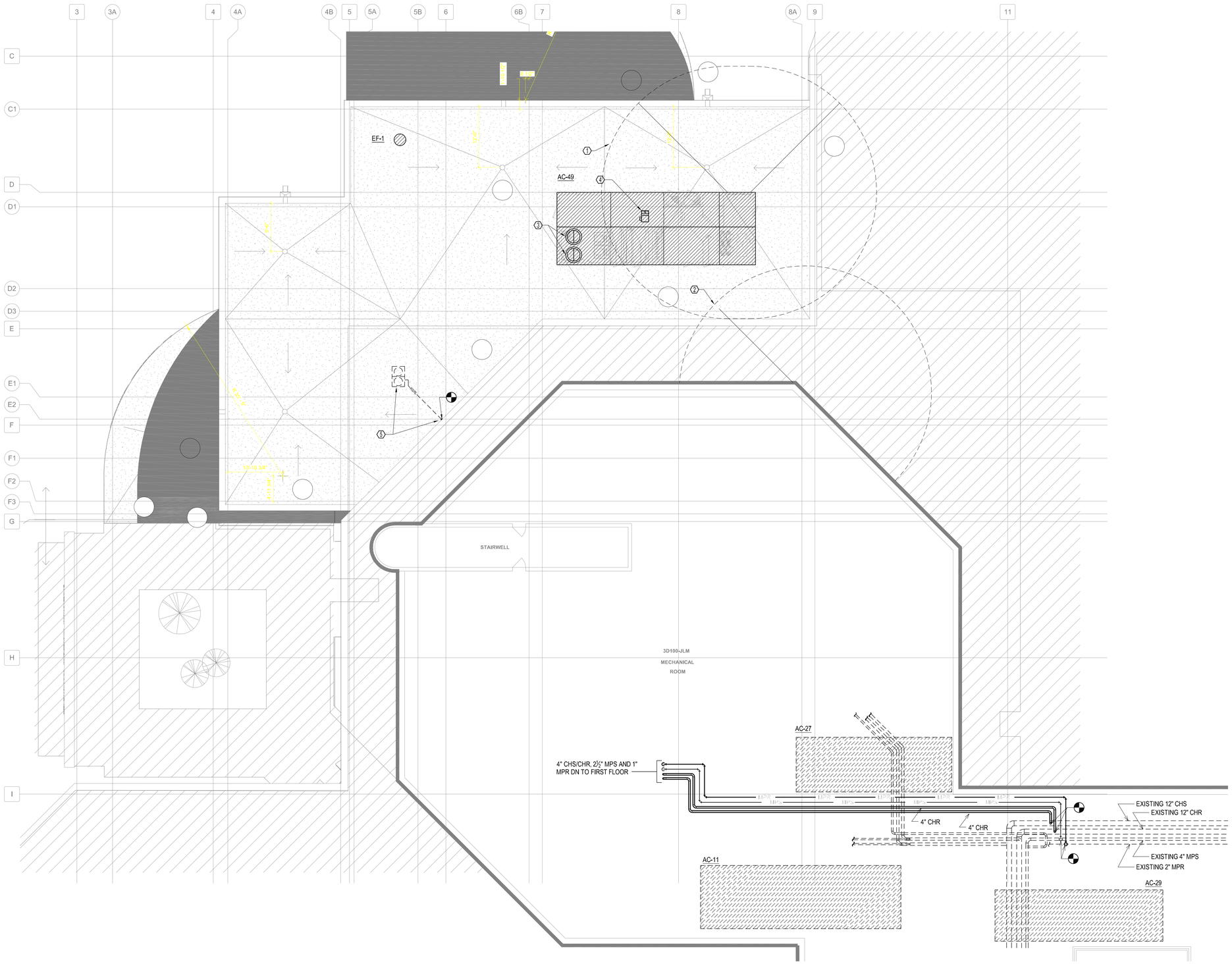


1 HVAC PARTIAL ROOF AND THIRD FLOOR MECHANICAL ROOM PLANS

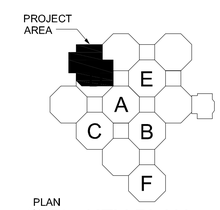
1/8"=1'-0"

GENERAL NOTES:

SEE SHEET MI001 FOR GENERAL NOTES

KEY NOTES:

1. 25'-0" REQUIRED CLEARANCE FROM AC-49 OUTSIDE AIR INTAKE.
2. 25'-0" REQUIRED CLEARANCE FROM NEAREST OUTSIDE AIR INTAKE ON THIRD FLOOR.
3. VERTICAL EXHAUST DISCHARGE MINIMUM 10'-0" ABOVE ROOF.
4. 15 GALLON DUPLEX CONDENSATE RETURN PUMP. 4,000 SF 6 GPM, 1 HP EACH. PROVIDE COMPLETE NEMA 12 CONTROL PANEL. ISOLATION VALVES GAUGE GLASS AND SINGLE-POINT POWER CONNECTION.
5. NEW LOCATION OF EXISTING VRF CONDENSING UNIT. CONNECT REFRIGERANT PIPING AND POWER TO EXISTING AT WALL PENETRATION.



0 4' 8' 16'
SCALE: 1/8" = 1'-0"

PLAN NORTH

KEY PLAN

EDMH F.F.E.: 398.00'
PROJECT AREA: 17,075 S.F.

CONSTRUCTION DOCUMENTS SUBMISSION
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Revisions: | Date

CONSULTANTS:

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Drawing Title: HVAC PARTIAL ROOF AND THIRD FLOOR MECHANICAL ROOM PLANS

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**

Building Number: 1

Drawing Number: MH105

Dwg. **98** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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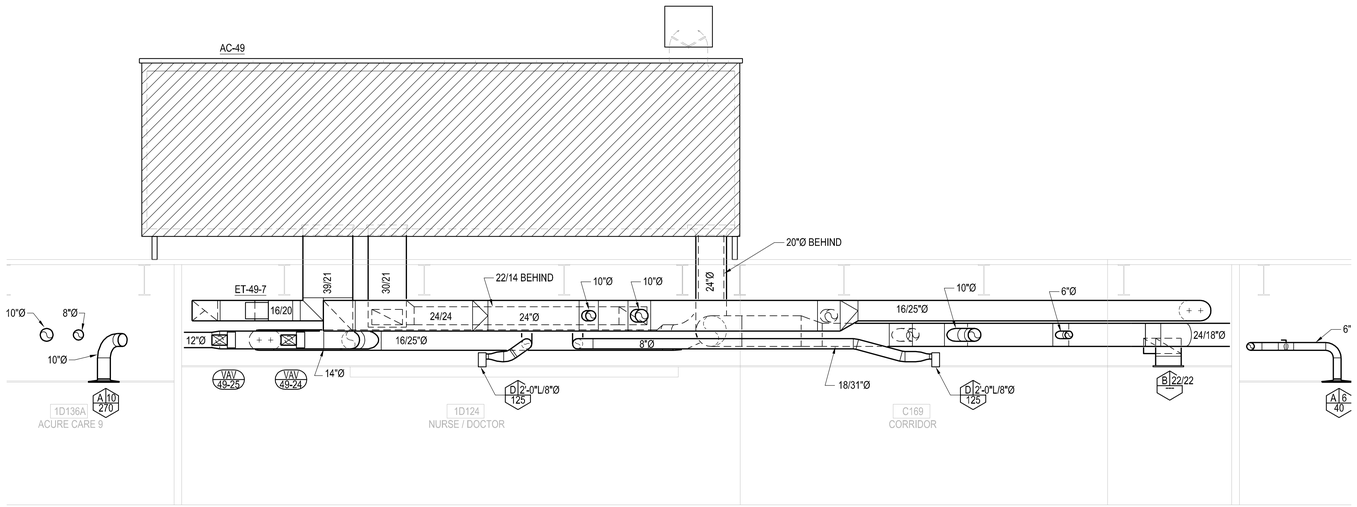
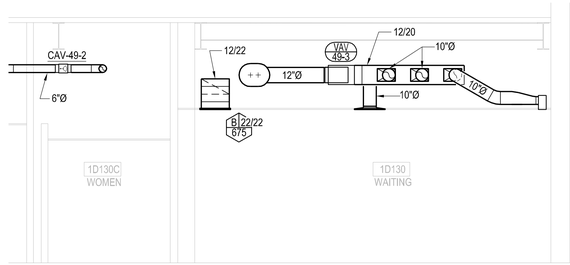
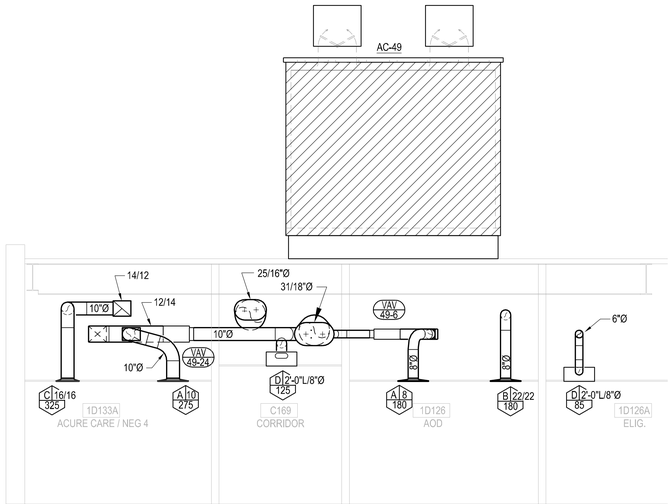


1 SECTION
1/4"=1'-0"



2 SECTION
1/4"=1'-0"



3 SECTION
1/4"=1'-0"

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Revisions: Date

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Drawing Title: HVAC SECTIONS

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**
Building Number: 1
Drawing Number: MH301
Dwg. **99** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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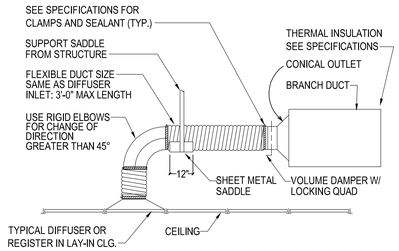
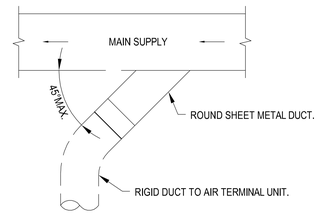


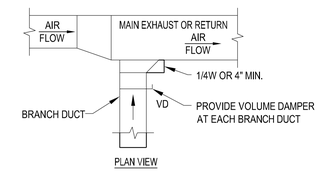
NOTE:
THE USE OF FLEXIBLE AIR DUCT CONNECTORS ARE NOT PERMITTED FOR THE DEDICATED AHU SERVING THE SURGICAL SUITE.

4 FLEXIBLE AIR DUCT CONNECTOR
NO SCALE



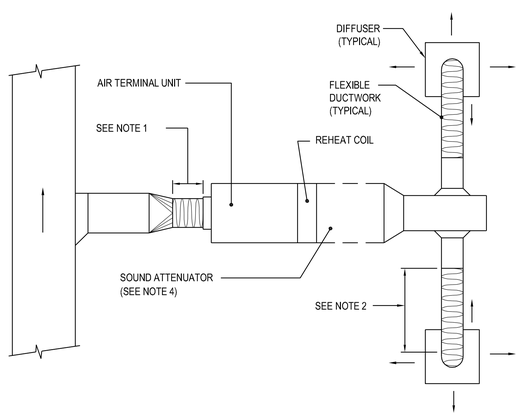
PLAN VIEW

5 SUPPLY DUCT TAKE-OFF - AIR TERMINAL UNIT
NO SCALE



PLAN VIEW

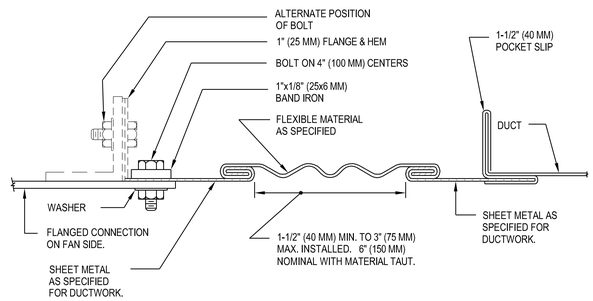
6 EXHAUST OR RETURN BRANCH DUCTWORK
NO SCALE



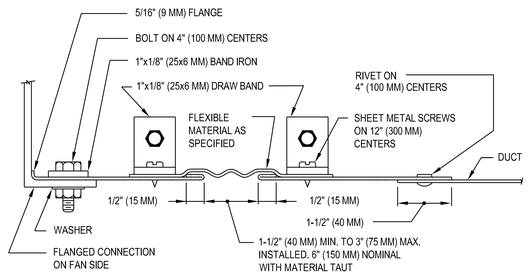
NOTES:

1. FLEXIBLE DUCT CONNECTION OF 3'-0" (1.0 M) MAXIMUM LENGTH SHALL BE PROVIDED FOR AIR TERMINAL UNIT INLET DUCT CONNECTION.
2. FLEXIBLE DUCT CONNECTION (WHEN USED) FROM TERMINAL UNIT SUPPLY AIR DUCT TO DIFFUSER SHALL NOT EXCEED 5'-0" (1.5 M)
3. BENDS SHALL BE MADE WITH NOT LESS THAN ONE DUCT DIAMETER CENTER LINE RADIUS.
4. USE SOUND ATTENUATOR ONLY, IF REQUIRED, TO MEET DESIGN ROOM NC LEVEL.

1 FLEXIBLE DUCT CONNECTIONS FOR AIR TERMINAL UNITS
NO SCALE

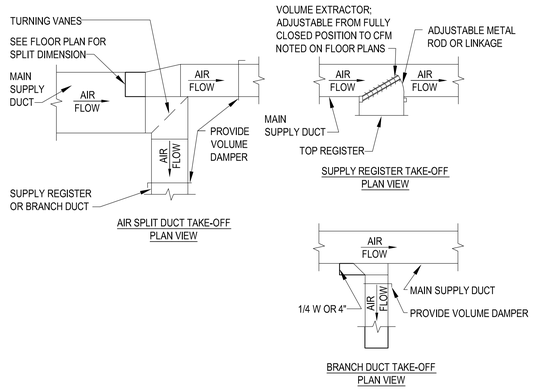


RECTANGULAR FLEXIBLE CONNECTION



ROUND FLEXIBLE CONNECTION

2 FLEXIBLE DUCT CONNECTIONS
NO SCALE



DESIGNER'S NOTES:

1. THE SUPPLY REGISTER TAKE-OFF MAY BE USED FOR UP UP TO 25% OF THE MAIN DUCT CFM. THE BRANCH DUCT TAKE-OFF MAY BE USED FOR UP TO 15% OF THE MAIN DUCT CFM ANYTIME AND UP TO 40% WHEN THE MAIN DUCT VELOCITY IS 1000 FPM [5.1 M/S] OR LESS. THE AIR SPLIT DUCT TAKE-OFF SHALL BE USED IN ALL OTHER CASES AND MAY BE USED AT ANYTIME.
2. SHOW ALL VOLUME DAMPERS ON FLOOR PLANS.

3 SUPPLY DUCT TAKE-OFF DETAIL
NO SCALE

CONSTRUCTION DOCUMENTS SUBMISSION
FULLY SPRINKLERED

Revisions:	Date

CONSULTANTS:

CIVIL:
CROMWELL
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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9395 CHRISTOPHER R. BORNÉ 03/06/2015

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Drawing Title: HVAC DETAILS

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**

Building Number: **1**

Drawing Number: MH501

Dwg. **100** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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GENERAL NOTES:

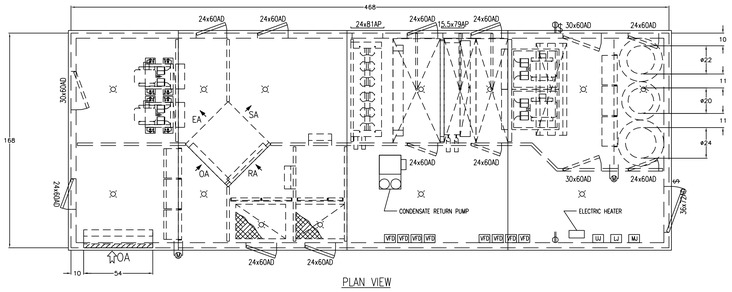
1. OVERALL UNIT DIMENSIONS ARE NOMINAL AND DO NOT ACCOUNT FOR CASING PROTRUSIONS, SECTION GASKETING, DOOR HANDLES, EXTENDED CONNECTIONS, EXTERIOR MOUNTED DEVICES, MANUFACTURING TOLERANCES, ETC. CONTRACTOR TO VERIFY ACCEPTABLE CLEARANCES FOR INSTALLATION OF THIS EQUIPMENT.
2. MINIMUM SERVICE CLEARANCE REQUIRED BEYOND EXTERIOR OF UNIT FOR PULLING COIL(S) IS COIL LENGTH PLUS APPROXIMATELY 15.
3. DOOR SIZES LISTED ARE NOMINAL.
4. ACTUAL LOCATION OF VFD'S, ELECTRIC HEATER, JUNCTION BOXES, RECEPTACLES AND CONDENSATE RETURN PUMP T.B.D.

MASTER LEGEND

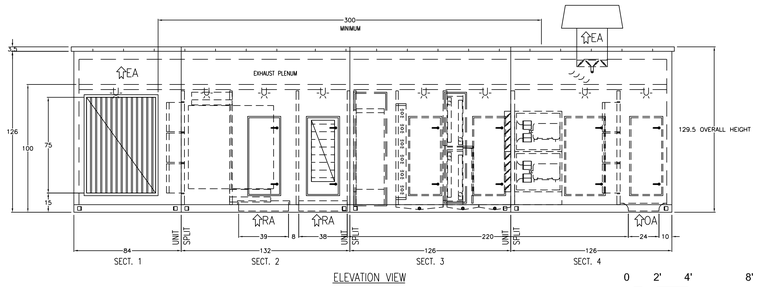
= COMPARTMENT LIGHT	= MAGNEHELIC GAGE	M =460/3/60 J-BOX
= LIGHT SWITCH	= PHOTOHELIC GAGE	L =120/1/60 LIGHT CIRCUIT J-BOX
= RECEPTACLE	= FLOOR DRAIN	U =120/1/60 UVC LIGHT CIRCUIT J-BOX

TOP ROW (PLAN VIEW LEFT-RIGHT)
1. EXHAUST FAN SECTION
2. FLAT-PLATE HEAT EXCHANGER/ECONOMIZER
3. MIXING SECTION WITH FILTERS
4. STEAM PRE-HEAT COIL W/ FACE AND BYPASS
5. STEAM HUMIDIFIER
6. COOLING COIL
7. UV LIGHT/ACCESS SECTION
8. SUPPLY FAN
9. FINAL FILTER
10. DISCHARGE PLENUM

BOTTOM ROW (PLAN VIEW LEFT-RIGHT)
1. OUTSIDE AIR INTAKE WITH FILTERS
2. FLAT-PLATE HEAT EXCHANGER/ECONOMIZER
3. EXHAUST/RETURN PLENUMS WITH BYPASS FOR 100% OUTSIDE AIR
4. WALK-IN PIPING VESTIBULE / ACCESS SECTION



PLAN VIEW

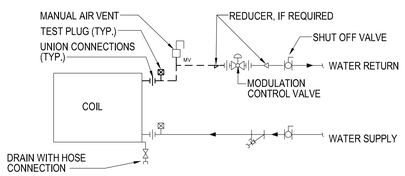


ELEVATION VIEW

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

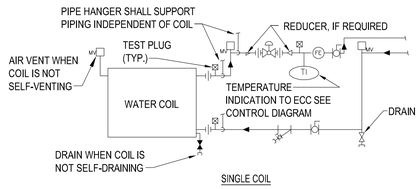
6 DETAIL: ROOFTOP UNIT AC-49

1/4"-1'-0"



4 VAV WATER COILS - PIPING CONNECTIONS

NO SCALE



SINGLE COIL

NOTES:

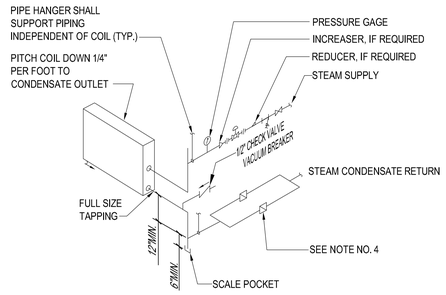
WHEN COIL IS INCLUDED IN CASING MOUNTED ON VIBRATION ISOLATORS THE FIRST 2 HANGERS FOR EACH PIPE SHALL BE SPRING & NEOPRENE TYPE. TYPE "H" FOR 4"Ø PIPE & SMALLER. TYPE "H-P" FOR 5"Ø PIPE & LARGER.

PIPING SHALL BE INSTALLED IN SUCH MANNER THAT IT WILL NOT BLOCK THE SWING OR USE OF ACCESS DOORS OR PANELS; NEITHER SHALL IT BLOCK THE SERVICING OF FILTERS, VALES, OR EQUIPMENT.

THE FLOW ELEMENT MAY BE INSTALLED IN THE SUPPLY PIPING IF THE REQUIRED MINIMUM UPSTREAM AND DOWNSTREAM DIMENSIONS CANNOT BE OBTAINED IN THE RETURN PIPING.

5 WATER COILS - PIPING CONNECTION

NO SCALE

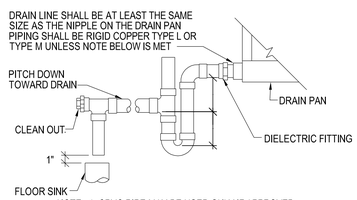


NOTES:

1. WHEN COIL IS INCLUDED IN CASING MOUNTED ON VIBRATION ISOLATOR UNITS, THE RUNOUT PIPING FOR CONNECTIONS TO COIL SHALL BE INSTALLED WITH SWING JOINTS TO ALLOW FOR THE VIBRATION.
2. PIPING SHALL BE INSTALLED IN SUCH MANNER THAT IT WILL NOT BLOCK THE SWING OR USE OF ACCESS DOORS OR PANELS; NEITHER SHALL IT BLOCK THE SERVICING OF FILTERS, VALVES, OR EQUIPMENT.
3. TRAP EACH COIL SEPARATELY WHEN INSTALLED IN A BANK OF TWO OR MORE HIGH. ALSO PROVIDE SEPARATE VACUUM BREAKER FOR EACH COIL.
4. TWO TRAP ASSEMBLIES IN PARALLEL ARE SHOWN. TWO TRAPS REQUIRED WHEN CONDENSATE LOAD IS 5,000 LBS/HR [2400 KG/HR] OR GREATER.
5. SUPPLY & RETURN PIPES ARE SHOWN FROM SAME END. REHEAT COIL MAY HAVE SUPPLY & RETURN PIPES FROM OPPOSITE ENDS.

6 STEAM COILS - PIPING CONNECTION

NO SCALE



NOTE: 1. CPVC PIPE MAY BE USED ONLY IF APPROVED BY LOCAL VA AND IS INDOORS AND DOES NOT PASS THROUGH RATED BARRIERS.

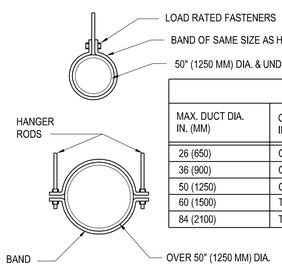
2. DIELECTRIC FITTING TO BE USED WHEN TWO DISSIMILAR METALS ARE TO BE CONNECTED.

UNIT TYPE	A	B
DRAW THRU	2" [50mm] PLUS X	X
BLOW THRU	1" [25mm] MINIMUM	2X

WHERE X = STATIC PRESSURE IN PAN

1 AIR HANDLING UNIT DRAIN TRAP DETAIL

NO SCALE



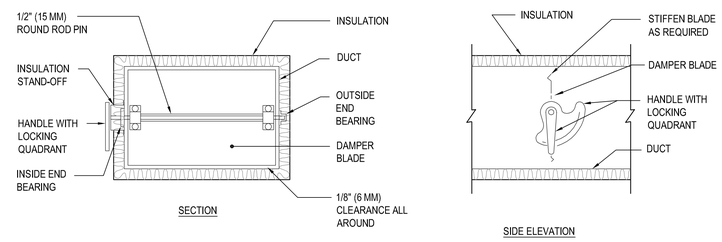
HANGER STRAPS OR RODS			
MAX. DUCT DIA. IN. (MM)	QUANTITY / SIZE IN. (MM)	MAX. LOAD LBS. (KG)	MAX. SPACING FT. (M)
26 (650)	ONE 1 (25) x 22 GA STRAP	260 (119)	12 (3.7)
36 (900)	ONE 1 (25) x 18 GA STRAP	420 (190)	12 (3.7)
50 (1250)	ONE 1 (25) x 16 GA STRAP	700 (317)	12 (3.7)
60 (1500)	TWO 3/8 (10) DIA. RODS	1320 (598)	12 (3.7)
84 (2100)	TWO 1/2 (13) DIA. RODS	2500 (1133)	12 (3.7)

NOTE:

1. TABULATED DATA FROM SMACNA ALLOWS FOR DUCT REINFORCING AND INSULATION, BUT NO EXTERNAL LOAD.

2 ROUND DUCT HANGERS

NO SCALE



NOTES:

1. DELETE INSULATION STAND-OFF ON DUCTWORK WITHOUT EXTERIOR INSULATION.
2. DETAIL SHOWS SINGLE BLADE DAMPER. DAMPER INSTALLATION SHALL BE SIMILAR FOR MULTI-BLADE DAMPERS & ROUND DAMPERS.

3 VOLUME DAMPER DETAIL

NO SCALE

CONSTRUCTION DOCUMENTS SUBMISSION
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Revisions: Date

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03/06/2015

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Drawing Title: HVAC DETAILS

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

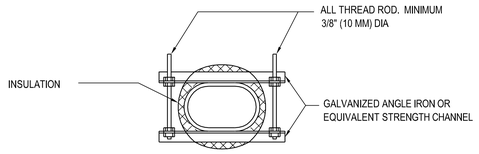
Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**
Building Number: 1
Drawing Number: MH502
Dwg. **101** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

VA FORM 08-6231 8/28/2014 2:15:40 PM



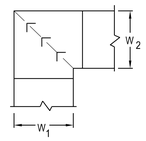
NOTE:

1. PROVIDE BRACING TO LIMIT THE AMPLITUDE OF WALL VIBRATION AND WALL DEFLECTION TO SPECIFIED MAXIMUMS.
2. MINIMUM BRACING REQUIREMENTS:

MAXIMUM DUCT WIDTH IN (MM)	MINIMUM SIZE ANGLE IN. (MM)	MAXIMUM SPACING FT. (M)
UP TO 26 (650)	NONE	
27 (675) TO 40 (1000)	1-1/2x1-1/2x3/16 (40x40x7)	6 (1.83)
41 (1025) TO 60 (1500)	2x2x3/16 (50x50x7)	4 (1.22)
61 1525) TO 72 (1800)	2x2x3/16 (50x50x7)	2 (0.61)

3. INSULATION: FOR COLD DUCTS INSULATE BRACES AND PROVIDE VAPOR BARRIER..

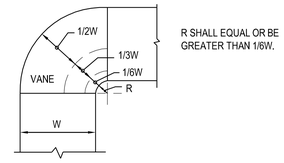
4 FLAT OVAL DUCT HANGERS / REINFORCEMENT
NO SCALE



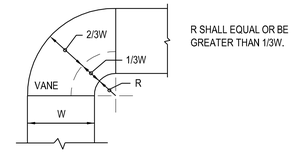
NOTES:

1. ALL VANED ELBOWS SHALL BE CONSTRUCTED AND INSTALLED AS DETAILED BY SMACNA.
2. WHEN W_1 DOES NOT EQUAL W_2 VANE SHALL BE SINGLE VANE TYPE REGARDLESS OF W DIMENSION.
3. ALL SINGLE VANES SHALL HAVE A 2" (50 MM) RADIUS, 1 1/2" (40 MM) MAXIMUM SPACE BETWEEN VANES AND A 3/4" (20 MM) TRAILING EDGE.
4. WHEN W_1 EQUALS W_2 AND W_1 IS GREATER THAN 20" (500 MM) VANES SHALL BE DOUBLE VANE TYPE.

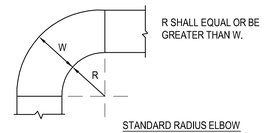
5 DUCTWORK SQUARE VANED ELBOWS
NO SCALE



SHORT RADIUS ELBOW WITH TWO VANES



SHORT RADIUS ELBOW WITH ONE VANE

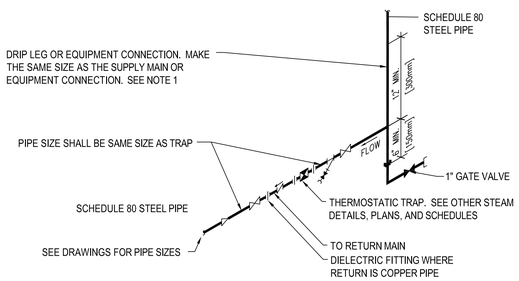


STANDARD RADIUS ELBOW

NOTES:

1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.
2. ALL STANDARD RADIUS ELBOWS SHOWN ON FLOOR PLANS MAY BE MADE SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA.

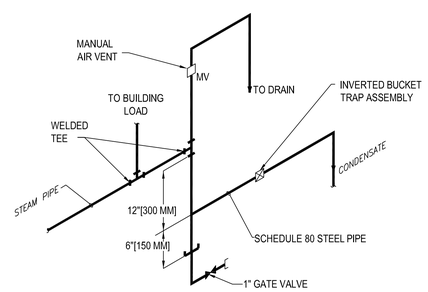
6 DUCTWORK RADIUS ELBOWS
NO SCALE



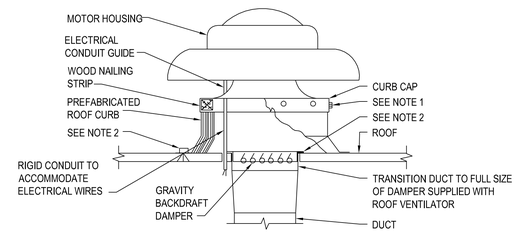
NOTE:

1. ALL DRIP POINTS ON STEAM MAINS SHALL BE PROVIDED WITH A 12" MINIMUM HIGH DRIP LEG FROM BOTTOM OF STEAM MAIN TO TRAP INLET. DRIP LEG SHALL HAVE 6" SCALE POCKET BELOW TRAP INLET.

1 THERMOSTATIC STEAM TRAP ASSEMBLY
NO SCALE



2 END OF STEAM LINE DRIP TRAP
NO SCALE



NOTE:

1. SECURE CURB CAP TO WOOD NAILING STRIP WITH 3/8" [10mm] CADMIUM PLATED LAG BOLTS NOT OVER 12" [300mm] ON CENTER.
2. SECURE ROOF CURB, DUCTWORK AND DAMPER TO ROOF WITH EXPANSION BOLTS (CONCRETE ROOF) OR RUST RESISTANT BOLTS (METAL DECK AND BAR JOIST ROOF).

   RUN ELECTRICAL LINES THROUGH CLEARANCE HOLE PROVIDED IN GRAVITY DAMPER, THEN
3. THROUGH VENTILATOR ELECTRICAL CONDUIT GUIDE.

3 POWER ROOF VENTILATOR
NO SCALE

CONSTRUCTION DOCUMENTS SUBMISSION
FULLY SPRINKLERED

Revisions: | Date

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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9395 CHRISTOPHER S. STONE 03/06/2015

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Drawing Title: HVAC DETAILS

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: DRW | Checked: CHK

Project Number: **CSI-112**

Building Number: 1

Drawing Number: MH503

Dwg. **102** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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VENTILATION SCHEDULE

ROOM NO.	ROOM NAME	ROOM CEILING HEIGHT (FT)	ROOM AREA (SQFT)	MINIMUM AIR CHANGES PER HOUR *	OUTSIDE AIR CHANGES PER HOUR *	MINIMUM REQUIRED SUPPLY AIR (CFM)	MINIMUM REQUIRED OUTSIDE AIR (CFM)	MINIMUM REQUIRED EXHAUST AIR (CFM)	REQUIRED HUMIDITY (RH%)	REQUIRED FILTRATION (PRE / FINAL)	REQUIRED AIR MOVEMENT	DESIGN SUPPLY AIR (CFM)	DESIGN RETURN AIR (CFM)	DESIGN EXHAUST AIR (CFM)	DESIGN AIR MOVEMENT
1D105	PSYCH CONSULT	8	117	4	2	62	31		30% - 60%	MERV 11 / MERV 14		155	155		-
1D106	PHYSICIANS WORK ROOM	8	163	4	2		43		30% - 60%	MERV 11 / MERV 14		225	225		-
1D106B	TOILET/SHOWER	8	71	10	2		19	95	30% - 60%	MERV 11 / MERV 14	NEG			105	-
1D107	SHARED OFFICE	8	158	4	2	84	42		30% - 60%	MERV 11 / MERV 14		230	230		-
1D108	BREAKROOM/ LOCKERS	8	299	10	2		80	399	30% - 60%	MERV 11 / MERV 14	NEG	375		500	-
1D108A	ST TOILET	8	60	10	2		16	80	30% - 60%	MERV 11 / MERV 14	NEG			100	-
1D108B	ST SHOWER	8	56	10	2		15	75	30% - 60%	MERV 11 / MERV 14	NEG			100	-
1D109	SHARED OFFICE	8	159	4	2	85	42		30% - 60%	MERV 11 / MERV 14		230	230		
1D110	WORK/CONF.	8	352	4	2	188	94		30% - 60%	MERV 11 / MERV 14		350	350		
1D111	STOR. EQUIP.	8	137	2	2	37	37		30% - 60%	MERV 11 / MERV 14		50	50		
1D112	EQUIP. STORAGE	8	104	2	2	28	28		30% - 60%	MERV 11 / MERV 14		50	50		
1D113	ED DIRECTOR CONSULT	8	125	4	2	67	33		30% - 60%	MERV 11 / MERV 14		185	185		-
1D114	PSYCH DR. CONSULT	8	109	4	2	58	29		30% - 60%	MERV 11 / MERV 14		110	110		-
1D115	NURSE MANAGER CONSULT	8	147	4	2	78	39		30% - 60%	MERV 11 / MERV 14		175	175		
1D116	EXISTING (ELEC)	9	65	6	2		20	59	30% - 60%	MERV 11 / MERV 14	NEG			100	
1D117A	FAST TRACK 5	8	117	6	2	94	31		30% - 60%	MERV 11 / MERV 14		190	190		
1D117B	FAST TRACK 4	8	118	6	2	94	31		30% - 60%	MERV 11 / MERV 14		190	190		
1D117C	FAST TRACK 3	8	117	6	2	94	31		30% - 60%	MERV 11 / MERV 14		190	190		
1D118A	FAST TRACK 8	8	118	6	2	94	31		30% - 60%	MERV 11 / MERV 14		190	190		
1D118B	FAST TRACK 7	8	118	6	2	94	31		30% - 60%	MERV 11 / MERV 14		190	190		-
1D118C	FAST TRACK 6	8	118	6	2	94	31		30% - 60%	MERV 11 / MERV 14		190	190		
1D120	TOILET	8	62	10	2		17	83	30% - 60%	MERV 11 / MERV 14	NEG			100	-
1D122	STORAGE	8	104	2	2	28	28		30% - 60%	MERV 11 / MERV 14		50	50		-
1D123	NURSE / DOCTOR	9.333	196	6	2	183	61		30% - 60%	MERV 11 / MERV 14		370	370		
1D124	NURSE / DOCTOR	9.333	466	6	2	435	145		30% - 60%	MERV 11 / MERV 14		570	570		
1D124A	MEDS	8	66	4	2	35	18		30% - 60%	MERV 11 / MERV 14	POS	100	0		
1D124B	SOILED UTILITY	8	129	6	2		34	103	30% - 60%	MERV 11 / MERV 14	NEG	115		165	
1D125A	FAST TRACK 2	8	111	6	2	89	30		30% - 60%	MERV 11 / MERV 14		190	190		-
1D125B	FAST TRACK 1	8	111	6	2	89	30		30% - 60%	MERV 11 / MERV 14		190	190		
1D125C	ACUTE CARE / ISO 1	8	120	10	2		32	160	30% - 60%	MERV 11 / MERV 14		260		310	-
1D125D	ACUTE CARE / ISO 2	8	122	10	2		33	163	30% - 60%	MERV 11 / MERV 14		260		310	-
1D125E	ACUTE CARE / ISO 3	8	120	10	2		32	160	30% - 60%	MERV 11 / MERV 14		260		310	-
1D126	AOD	8	128	6	2	102	34		30% - 60%	MERV 11 / MERV 14		180	180		
1D126A	ELIG.	8	112	6	2	90	30		30% - 60%	MERV 11 / MERV 14		170	170		
1D127A	EKG/BLOOD	8	83	6	2	66	22		30% - 60%	MERV 11 / MERV 14		185	185		-
1D127B	TOILET	8	73	10	2		19	97	30% - 60%	MERV 11 / MERV 14	NEG			135	-
1D131A	FAMILY	8	132	4	2	70	35		30% - 60%	MERV 11 / MERV 14		155	155		
1D128	TRIAGE 2	8	101	12	2		27	162	30% - 60%	MERV 11 / MERV 14	NEG	150		200	-
1D129	TRIAGE 1	8	96	12	2		26	154	30% - 60%	MERV 11 / MERV 14	NEG	150		200	
1D130	WAITING (NORTH)	10	569	12	2		190	1138	30% - 60%	MERV 11 / MERV 14	NEG	1250		1400	
1D130	WAITING (SOUTH)	10	484	12	2		161	968	30% - 60%	MERV 11 / MERV 14	NEG	1000		1400	
1D130A	VESTIBULE	11.5	115	0	2	0	44		30% - 60%	MERV 11 / MERV 14					-
1D130B	MENS	8	67	10	2		18	89	30% - 60%	MERV 11 / MERV 14	NEG			125	
1D130C	WOMENS	8	56	10	2		15	75	30% - 60%	MERV 11 / MERV 14	NEG			100	-
1D130D	WAITING / ISO	10	83	12	2		28	166	30% - 60%	MERV 11 / MERV 14	NEG	400		500	
1D131	RECEPTION	8.5	203	12	2		58	345	30% - 60%	MERV 11 / MERV 14		400		WITH 1D130	
1D127C	ELECTRICAL	8	87	6	2		23	70	30% - 60%	MERV 11 / MERV 14		200		200	
1D131B	COPIER/SUP.	9	22	6	2		7	20	30% - 60%	MERV 11 / MERV 14		WITH C166			
1D132	DECONTAM.	8	231	10	2		62	308	30% - 60%	MERV 11 / MERV 14	NEG	270		350	
1D132A	DECON STORAGE	8	51	2	2	14	14		30% - 60%	MERV 11 / MERV 14		40	40		
1D133A	ACUTE CARE 4 / ISO	8	120	10	2	160	32	160	30% - 60%	MERV 11 / MERV 14	NEG	275	275	325	-
1D133B	ACUTE CARE 5 / ISO	8	120	10	2	160	32	160	30% - 60%	MERV 11 / MERV 14	NEG	275	275	325	-
1D133C	ACUTE CARE 6 / ISO	8	119	10	2	159	32	159	30% - 60%	MERV 11 / MERV 14	NEG	275	275	325	-
1D134	ACUTE CARE / ISO 7	8	140	12	2		37	224	30% - 60%	MERV 11 / MERV 14	NEG	290		380	-
1D134A	TOILET	8	65	10	2		17	87	30% - 60%	MERV 11 / MERV 14	NEG			110	-
1D135	ACUTE CARE / GYN 8	8	130	6	2	104	35		30% - 60%	MERV 11 / MERV 14	NEG	270			
1D135A	TOILET	8	62	10	2		17	83	30% - 60%	MERV 11 / MERV 14	NEG			110	-
1D136A	ACUTE CARE 9	8	120	6	2	96	32		30% - 60%	MERV 11 / MERV 14		260	260		
1D136B	ACUTE CARE 10	8	162	6	2	130	43		30% - 60%	MERV 11 / MERV 14		280	280		
1D136C	ACUTE CARE 11	8	162	6	2	130	43		30% - 60%	MERV 11 / MERV 14		280	280		
1D137	NURSE / DOCTOR	9.333	335	6	2	313	104		30% - 60%	MERV 11 / MERV 14		500	500		
1D137A	MEDS	8	75	4	2	40	20		30% - 60%	MERV 11 / MERV 14	POS	115	0		
1D137B	CLEAN UTILITY	8	73	4	2	39	19		30% - 60%	MERV 11 / MERV 14	POS	50	0		
1D137C	SHOWER	8	66	10	2		18	88	30% - 60%	MERV 11 / MERV 14	NEG	0	0	110	
1D138	ANTE	8	36	6	2	29	10		30% - 60%	MERV 11 / MERV 14		40	40		
1D138A	MENTAL HEALTH 1	8	125	6	2	100	33		30% - 60%	MERV 11 / MERV 14		195	195		
1D138B	TOILET	8	52	10	2		14	69	30% - 60%	MERV 11 / MERV 14				100	
1D138C	MENTAL HEALTH 2	8	126	6	2	101	34		30% - 60%	MERV 11 / MERV 14		195	195		
1D139	ANTE	8	36	6	2	29	10		30% - 60%	MERV 11 / MERV 14		40	40		
1D139A	MENTAL HEALTH 3	8	126	6	2	101	34		30% - 60%	MERV 11 / MERV 14	NEG	195	195		-
1D139B	TOILET	8	52	10	2		14	69	30% - 60%	MERV 11 / MERV 14	NEG			100	-
1D139C	MENTAL HEALTH 4	8	129	6	2	103	34		30% - 60%	MERV 11 / MERV 14		195	195		
1D140	ACUTE CARE 16	8	125	6	2	100	33		30% - 60%	MERV 11 / MERV 14		260	260		
1D140A	TOILET	8	60	10	2		16	80	30% - 60%	MERV 11 / MERV 14	NEG			110	
1D141	ACUTE CARE 15	8	125	6	2	100	33		30% - 60%	MERV 11 / MERV 14		290	290		
1D142	EXISTING (TELE. & SIGNAL)	8	107	6	2		29	86	30% - 60%	MERV 11 / MERV 14	NEG		100	110	
1D143	ACUTE CARE 14	8	125	6	2	100	33		30% - 60%	MERV 11 / MERV 14		260	260		
1D143A	TOILET	8	65	10	2		17	87	30% - 60%	MERV 11 / MERV 14	NEG			110	-
1D144	ACUTE CARE 13	8	120	6	2	96	32		30% - 60%	MERV 11 / MERV 14		260	260		
1D144A	TOILET	8	62	10	2		17	83	30% - 60%	MERV 11 / MERV 14	NEG			110	
1D147	ACUTE CARE 12	8	120	6	2	96	32		30% - 60%	MERV 11 / MERV 14		260	260		
1D147A	TOILET	8	64	10	2		17	85	30% - 60%	MERV 11 / MERV 14	NEG			110	
1D147B	HAC	8	75	10	2		20	100	30% - 60%	MERV 11 / MERV 14	NEG	50	50	125	
C165, 165A	CORRIDOR	9	1321	2	0.5	396	99		30% - 60%	MERV 11 / MERV 14		325	325		
C166, C166A, C166B	CORRIDOR	9	610	2	0.5	183	46		30% - 60%	MERV 11 / MERV 14		250			
C167, 167A, C188A	CORRIDOR	9	983	2	0.5	295	74		30% - 60%	MERV 11 / MERV 14		375			-
C168(N), C169, C198(N)	CORRIDOR	9	1182	2	0.5	355	89		30% - 60%	MERV 11 / MERV 14		450			-
C168A, C168B, C168(S), C198(S)	CORRIDOR	9	711	2	0.5	213	53		30% - 60%	MERV 11 / MERV 14		350			-
C169A	VESTIBULE	10	143	0	2	0	48		30% - 60%	MERV 11 / MERV 14					

* PER "HVAC DESIGN MANUAL FOR NEW, REPLACEMENT, ADDITION AND RENOVATION OF EXISTING VA FACILITIES - MARCH 2011". OR ASHRAE 170 - VENTILATION OF HEALTH CARE FACILITIES (ANSI/ASHRAE/ASHE APPROVED)

CONSTRUCTION DOCUMENTS SUBMISSION
FULLY SPRINKLERED

Revisions: | Date

CONSULTANTS:

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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9395 CHRISTOPHER R. BORNÉ 09/06/2014

ARCHITECT/ENGINEERS:

BES DESIGN/BUILD

BES DESIGN/BUILD, LLC
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Drawing Title: HVAC SCHEDULES

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**

Building Number: 1

Drawing Number: MH601

Dwg. **103** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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AIR HANDLING UNIT

MARK	SERVES	LOCATION	SUPPLY CFM (MAXIMUM)	OSA CFM (MAXIMUM)	EXHAUST CFM (MAXIMUM)	SUPPLY FANS	EXHAUST FANS	HEAT EXCHANGER	PRE-HEAT COIL	HUMIDIFIER	COOLING COIL	FILTERS		REFERENCE PRODUCT
						MARK	MARK	MARK	MARK	MARK	MARK	PRE-FILTERS	FINAL FILTERS	
AC-49	EMERGENCY DEPARTMENT	ROOF	17,800 (1)	17,800 (1)	17,800 (1)	AHSF-49A, -49B, -49C, -49D	AHEF-49A, -49B, -49C, -49D	HX-49	PHC-49	H-49	CC-49	(2)	(3)	JOHNSON-MARCRAFT (4)(5)

(1) AIRFLOW INCLUDES 10.25% SAFETY FACTOR (5% AIR LEAKAGE, 5% SAFETY FACTOR).

(2) PRE-FILTER: MERV 8 MINIMUM EQUAL TO AMERICAN AIR FILTER 4" PERFECTPLEAT HC M8 (INITIAL 0.12" PD @ 300 FPM).

(3) FINAL FILTER: HIGH CAPACITY MERV 14 MINIMUM EQUAL TO AMERICAN AIR FILTER VARICEL V (INITIAL 0.49" PD @ 500 FPM).

(4) REFER TO SHEET MH502 FOR MORE ROOFTOP AIR HANDLER DETAILS.

(5) PROVIDE ROOF CURB SUITABLE FOR BUILDING SEISMIC CATEGORY.

HUMIDIFIER (STEAM)

MARK	SERVES	LOCATION	LBS./HR	STEAM PRESSURE PSI	REFERENCE PRODUCT
H-49	AC-49	AC-49	415	25	NORTEC SAM-e GRID (1)

(1) PROVIDED WITH AC-49. STAINLESS STEEL, SHORT-ABSORPTION MANIFOLD. PROVIDE SS VALVE, ACTUATOR, SS WYE STRAINER, SS INVERTED BUCKET TRAP, AIR PROVE SWITCH AND HIGH LIMIT SWITCH.

STEAM PRE-HEATING COIL

MARK	LOCATION	CFM	FACE VEL.	WIDTH	LENGTH	ROWS	FPF	MBH	EDB °F	MIN. LDB °F	STEAM PRESSURE PSI	LBS./HR	APD	REFERENCE PRODUCT
PHC-49	AC-49	17,800	647.3	70.4	60.0	1	72	461.0	31.0	55.0	9.0	483.2	0.14	AEROFIN VMX-6.0AS-70.4 x 60.0-1-1 (1)

(1) PROVIDE INTERNAL FACE AND BYPASS DAMPERS.

AIR HANDLING UNIT POWER SCHEDULE

MARK	CIRCUIT 1 (SINGLE POINT POWER)				CIRCUIT 2 (RECEPTACLES/LIGHTS)				CIRCUIT 3 (UV LIGHTS)			
	VOLTS/Ø	FLA	MCA	MOCP	VOLTS/Ø	FLA	MCA	MOCP	VOLTS/Ø	FLA	MCA	MOCP
AC-1 (1)	460/3Ø	136.1	141.4	200	120/1Ø	13.5	17.5	20	120/1Ø	2.6	3.3	15

(1) CKT 1: SUPPLY FANS, EXHAUST FANS, ELECTRIC HEATER AND CONDENSATE PUMP.
CKT 2: RECEPTACLES, LIGHTING AND CONTROL POWER.
CKT 3: UV LIGHTS.

CHILLED WATER COOLING COIL

MARK	LOCATION	CFM	FACE VEL.	COILS PER BANK	FIN HEIGHT (IN)	FIN LENGTH (IN)	ROWS	FPF	OPERATIONAL MODE	TOTAL MBH	SENS. MBH	EDB °F	LDB °F	EWB °F	LWB °F	APD	EWT °F	LWT °F	GPM	WPD	REFERENCE PRODUCT
CC-49	AC-49	17,800	456.4	2	39	72	8	144	NORMAL	1003.3	587.3	80.8	50.6	69.0	50.5	0.94	45.0	55.3	195	11.34	LUVATA 5WS1208B
									EMERGENCY (1)	1429.4	771.1	90.2	50.6	75.0	50.5	0.94	45.0	55.1	283	19.31	

(1) EMERGENCY MODE: 100% OUTSIDE AIR (10,300 CFM THROUGH HX-49, 7,500 CFM DIRECT)

VARIABLE FREQUENCY DRIVE SCHEDULE

MARK	SERVES		MOTOR HP	VOLT/Ø
	LOCATION	EQPT SERVED		
VFD-49-1	AC-49 MAINTENANCE VESTIBULE	AC-49: AHSF-1A	15	460/3Ø
VFD-49-2	AC-49 MAINTENANCE VESTIBULE	AC-49: AHSF-1B	15	460/3Ø
VFD-49-3	AC-49 MAINTENANCE VESTIBULE	AC-49: AHSF-1C	15	460/3Ø
VFD-49-4	AC-49 MAINTENANCE VESTIBULE	AC-49: AHSF-1D	15	460/3Ø
VFD-49-5	AC-49 MAINTENANCE VESTIBULE	AC-49: AHEF-1A	7.5	460/3Ø
VFD-49-6	AC-49 MAINTENANCE VESTIBULE	AC-49: AHEF-1B	7.5	460/3Ø
VFD-49-7	AC-49 MAINTENANCE VESTIBULE	AC-49: AHEF-1C	7.5	460/3Ø
VFD-49-8	AC-49 MAINTENANCE VESTIBULE	AC-49: AHEF-1D	7.5	460/3Ø

HEAT EXCHANGER (AIR-TO-AIR)

MARK	SERVES	SUPPLY CFM	EXHAUST CFM	OUTSIDE AIR COOLING MODE				OUTSIDE AIR HEATING MODE				ACTUAL OUTSIDE AIR SIDE PRESSURE DROP (in. wg.)	ACTUAL EXHAUST SIDE PRESSURE DROP (in. wg.)	EFFICIENCY				FACE VELOCITY FPM		REFERENCE PRODUCT
				EAT		LAT		EAT		LAT				SUMMER		WINTER				
				DB	WB	DB	WB	DB	WB	DB	WB			EXHAUST	SUPPLY	EXHAUST	SUPPLY	EXHAUST	SUPPLY	
HX-49	AC-49	10,300	9,800	99.2	77.3	83.9	73.3	7.9	7.0	48.1	34.4	0.79 / 0.87 (2)	0.73 / 0.76 (2)	67%	63%	63%	67%	460	484	HEATEX H2A1200-1651-050 2EOO-2-3-0-1651

(1) BASED ON THE FOLLOWING EXHAUST AIR TEMPERATURES:
SUMMER: 75°F db / 62°F wb
WINTER: 68°F db / 52° wb

(2) SUMMER / WINTER OPERATION.

CABINET UNIT HEATER

MARK	SERVES	ELECTRIC HEATING			FAN					ELECTRICAL			REFERENCE PRODUCT
		KW	STAGES	VOLTS/Ø	CFM	O.S.A.	ESP	NO.	WATTS (MAX.)	VOLTS/Ø	MCA	MOCP	
CUH-01	VESTIBULE 1D130A	2.5	1	277/1Ø	300	--	0.3	1	71.8	277/1Ø	12.02	15	DAIKIN FHHR103J (1)
CUH-02	AMBULANCE VESTIBULE C169A	2.5	1	277/1Ø	300	--	0.3	1	71.8	277/1Ø	12.02	15	DAIKIN FHHR103J (1)

(1) PROVIDE BACNET CONTROLLER, EC MOTOR, CEILING PLATE WITH TRIM FLANGE MOUNT AND BOTTOM STAMPED LOUVER RETURN AND FACTORY MOUNTED DISCONNECT.

EXHAUST FAN

MARK	SERVES	CFM	ESP	RPM	HP	VOLTS/Ø	MAX SONES	DRIVE	TYPE	WEIGHT	REFERENCE PRODUCT
EF-1	DECONT. 1D132	350	0.5	1614	1/6	120/1Ø	8.0	DIRECT	(1)	50 LBS	GREENHECK CUE-085-VG (2)

(1) DIRECT DRIVE, UPBLAST CENTRIFUGALROOF EXHAUST FAN.

(2) PROVIDE 18" HIGH ROOF CURB (COORDINATE WITH ROOF TYPE AND SLOPE), DISCONNECT AND ELECTRICALLY COMMUTATED MOTOR (ECM) FOR DDC CONTROL.

CONDENSATE RETURN PUMP

MARK	SERVES	CAPACITY SQ. FT. E.D.R.	DISCHARGE PRESSURE PSI	PUMP CAPACITY GPM	GPM	ARRANGEMENT	TANK CAPACITY GALLONS	VOLTS/Ø	REFERENCE PRODUCT
--	AC-49	4000	40	6	6.0	DUPLEX	15	460/3Ø	ARMSTRONG 4144-JD (1)

(1) PROVIDE WITH AND POWER FROM AC-49. (2) PROVIDE CONTROL PANEL, PUMP ALTERNATOR, THERMOMETER, DISCHARGE PRESSURE GAUGES, AND ISOLATION VALVES.

AIR HANDLING UNIT SUPPLY AND EXHAUST FANS

MARK	SERVICE	LOCATION	CFM	ESP IN.	TSP IN.	RPM DESIGN / MAX	HP	BHP	VOLTS Ø	DRIVE	CONTROLS	LwA	MAX. db AT OCTAVE BAND (FAN OUTLET - ARRAY)								REFERENCE PRODUCT
													63	125	250	500	1000	2000	4000	8000	
AHSF-49A, -49B, -49C, -49D	SUPPLY	AC-49	4,450	2.5	7.75	3523 / 3770	15.0	8.86	460/3	DIRECT	VFD	98	101	101	95	94	92	89	87	84	GREENHECK HPA-16-80-S-150 (1)
AHEF-49A, -49B, -49C, -49D	EXHAUST	AC-49	4,450	1.5	3.7	3590 / 3593	7.5	5.42	460/3	DIRECT	VFD	97	98	97	93	93	92	89	85	80	GREENHECK HPA-15-85-S-75 (1)

(1) AIRFOIL PLENUM FAN. FANS COMBINE TO A FOUR-FAN ARRAY.

CONSTRUCTION DOCUMENTS SUBMISSION
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Revisions: Date

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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER CHRISTOPHER R. BORNÉ No. 9395
03/06/2015

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Drawing Title: HVAC SCHEDULES

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**
Building Number: 1
Drawing Number: MH602
Dwg. **104** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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VAV TERMINAL BOXES (W/ HOT WATER HEAT)

MARK	SERVES	TYPE	INLET SIZE	MIN. OSA CFM	MAX. CFM	MIN. CFM (OCC.)	HEATING CFM	MIN. INLET S.P.	A.P.D.	MAX. N.C.	HOT WATER REHEAT						REFERENCE PRODUCT
											EAT	MIN. LAT	EWT	ROWS	MIN. MBH	GPM	
SERVED BY AC-49 (NEW AIR HANDLING UNIT)																	
49-1	SEE PLANS	1	10	100 2	825	375	375	1.0	0.3	30	55	80	180	2	10.2	0.5	TITUS DESV
49-2	SEE PLANS	1	06	80 2	310	250	250	1.0	0.25	30	55	90	180	2	9.5	0.5	TITUS DESV
49-3	SEE PLANS	1	12	205 3	1350	1050	1050	1.0	0.4	30	55	90	180	2	39.9	1.75	TITUS DESV
49-4	SEE PLANS	1	08	60 3	475	350	350	1.0	0.13	30	55	90	180	2	9.5	0.5	TITUS DESV
49-5	SEE PLANS	1	10	180 3	1050	750	750	1.0	0.44	30	55	90	180	2	28.5	1.5	TITUS DESV
49-6	SEE PLANS	1	06	35 2	180	100	100	1.0	0.06	30	55	80	180	1	2.7	0.5	TITUS DESV
49-7	SEE PLANS	1	06	30 2	150	100	100	1.0	0.04	30	55	80	180	1	2.7	0.5	TITUS DESV
49-8	SEE PLANS	1	06	60 2	340	200	200	1.0	0.19	30	55	80	180	1	5.4	0.5	TITUS DESV
49-9	SEE PLANS	1	06	0 2	200	0	N/A	1.0	0.03	30	COOLING ONLY						TITUS DESV
49-10	SEE PLANS	1	06	30 2	150	100	100	1.0	0.04	30	55	80	180	1	2.7	0.5	TITUS DESV
49-11	SEE PLANS	1	10	100 2	780	400	400	1.0	0.13	30	55	80	180	1	10.9	0.75	TITUS DESV
49-12	SEE PLANS	1	12	235 2	1050	775	775	1.0	0.13	30	55	80	180	1	21.0	1.25	TITUS DESV
49-13	SEE PLANS	1	06	55 2	250	125	125	1.0	0.1	30	55	80	180	1	3.4	0.5	TITUS DESV
49-14	SEE PLANS	1	08	60 2	380	200	200	1.0	0.08	30	55	80	180	1	5.4	0.5	TITUS DESV
49-15	SEE PLANS	1	08	105 2	420	310	310	1.0	0.09	30	55	80	180	1	8.4	0.5	TITUS DESV
49-16	SEE PLANS	1	08	30 2	400	150	150	1.0	0.17	30	55	105	180	2	8.1	0.5	TITUS DESV
49-17	SEE PLANS	1	10	160 2	775	575	575	1.0	0.13	30	55	80	180	1	15.6	1.25	TITUS DESV
49-18	SEE PLANS	1	08	95 2	390	250	250	1.0	0.08	30	55	80	180	1	6.8	0.5	TITUS DESV
49-19	SEE PLANS	1	08	95 2	390	250	250	1.0	0.08	30	55	80	180	1	88.2	0.5	TITUS DESV
49-20	SEE PLANS	1	08	95 2	570	250	250	1.0	0.08	30	55	80	180	1	6.8	0.5	TITUS DESV
49-21	SEE PLANS	1	08	95 2	570	250	250	1.0	0.15	30	55	80	180	1	6.8	0.5	TITUS DESV
49-22	SEE PLANS	1	08	100 2	500	450	450	1.0	0.12	30	55	80	180	1	12.2	1.0	TITUS DESV
49-23	SEE PLANS	1	06	40 2	225	125	125	1.0	0.09	30	55	80	180	1	3.4	0.5	TITUS DESV
49-24	SEE PLANS	1	06	55 2	290	290	290	1.0	0.22	30	55	80	180	2	7.9	0.5	TITUS DESV
49-25	SEE PLANS	1	06	55 2	270	150	150	1.0	0.19	30	55	80	180	2	4.1	0.5	TITUS DESV
49-26	SEE PLANS	1	10	120 2	820	450	450	1.0	0.14	30	55	80	180	1	12.2	0.75	TITUS DESV
49-27	SEE PLANS	1	12	220 2	1075	800	800	1.0	0.13	30	55	80	180	1	12.2	1.5	TITUS DESV
49-28	SEE PLANS	1	06	50 2	260	150	150	1.0	0.11	30	55	80	180	1	4.1	0.5	TITUS DESV
49-29	SEE PLANS	1	06	50 2	260	150	150	1.0	0.11	30	55	80	180	1	4.1	0.5	TITUS DESV
49-30	SEE PLANS	1	06	50 2	260	150	150	1.0	0.11	30	55	80	180	1	4.1	0.5	TITUS DESV
49-31	SEE PLANS	1	06	35 2	260	150	150	1.0	0.11	30	55	80	180	1	4.1	0.5	TITUS DESV
49-32	SEE PLANS	1	06	50 2	260	150	150	1.0	0.11	30	55	80	180	1	4.1	0.5	TITUS DESV
SERVED BY AC-11 (EXISTING AIR HANDLING UNIT)																	
11-1	SEE PLANS	1	06	25 2	150	150	150	1.0	0.04	30	55	80	180	1	4.1	0.5	TITUS DESV
11-2	SEE PLANS	1	06	60 2	140	140	140	1.0	0.04	30	55	80	180	--	3.8	0.5	TITUS DESV
11-3	SEE PLANS	1	08	130 2	410	200	200	1.0	0.09	30	55	80	180	1	5.4	0.5	TITUS DESV
11-4	SEE PLANS	1	10	150 2	730	350	350	1.0	0.12	30	55	80	180	1	9.5	0.5	TITUS DESV
11-5	SEE PLANS	1	06	95 2	340	150	150	1.0	0.19	30	55	80	180	1	4.1	0.5	TITUS DESV
11-6	SEE PLANS	1	08	110 2	375	150	150	1.0	0.08	30	55	80	180	1	4.1	0.5	TITUS DESV
11-7	SEE PLANS	1	06	60 2	225	110	110	1.0	0.09	30	55	80	180	1	2.8	0.5	TITUS DESV

1. SINGLE DUCT TERMINAL WITH FIBRE-FREE LINER.
2. OCCUPANCY DETERMINED BY LIGHTING OCCUPANCY SENSOR. USE AUXILIARY CONTACT.
3. ACTUAL OUTSIDE AIR VOLUME TO BE DETERMINED BY CO2 SENSOR. MULTIPLE BOXES SERVING THE SAME ROOM/ AREA MAY BE COMBINED ON A SINGLE SENSOR.

AIR DEVICE

KEY: NO. IF MORE THAN ONE — MARK: A 8 / 210 — NECK SIZE: 4 — CFM: 210

MARK	TYPE	DESCRIPTION	SIZE	REFERENCE PRODUCT
A	SUPPLY	SQUARE PLAQUE	SEE PLANS FOR DIMENSIONS	TITUS "OMNI" 1
B	RETURN	PERFORATED FACE	SEE PLANS FOR DIMENSIONS	TITUS "PAR" 2
C	EXHAUST	EGGCRATE	SEE PLANS FOR DIMENSIONS	TITUS "50F" 3
D	SUPPLY	LINEAR SLOT	SEE PLANS FOR DIMENSIONS	TITUS "TBD-30" 4
E	--	NOT USED	--	-- 5
F	XFER	DOOR GRILLE	SEE PLANS FOR DIMENSIONS	TITUS "CT-700L" 6
G	SUPPLY	LINEAR SLOT - MODULINEAR	SEE PLANS FOR DIMENSIONS	TITUS "ML-39" 7
H	SUPPLY	ROUND PLAQUE	SEE PLANS FOR DIMENSIONS	TITUS "OMNI-RS" 8

1. FOR LAY-IN CEILING (24/24 NOMINAL FRAME TYPE "3"). SQUARE PANEL FACE. PROVIDE MOLDED INSULATED BLANKET. PROVIDE DIRECTIONAL BLOW CLIPS WHERE INDICATED ON PLANS WITH FLOW ARROWS. PROVIDE MODEL "TRM" TRIM FRAME WHERE MOUNTED IN HARD CEILINGS.

2. FOR LAY-IN CEILING (24/12 OR 24/24 NOMINAL BORDER TYPE "3"). PERFORATED SCREEN WITH 3/16 " | HOLES ON 1/4 " STAGGERED CENTERS. ALUMINUM CONSTRUCTION. PROVIDE SQUARE TO SQUARE OR ROUND TRANSITION AS REQUIRED AND MOLDED INSULATED PLANKET. PROVIDE MODEL "TRM" TRIM FRAME WHERE MOUNTED IN HARD CEILINGS.

3. FOR LAY-IN CEILING (SIZE AS INDICATED ON PLANS, BORDER TYPE "3"), 1/2 X 1/2 X 1/2 EGGCRATE. ALUMINUM CONSTRUCTION. PROVIDE SQUARE TO SQUARE OR ROUND TRANSITION AS REQUIRED. PROVIDE MODEL "TRM" TRIM FRAME WHERE MOUNTED IN HARD CEILINGS OR CENTERED IN TILES.

4. ADJUSTABLE MODULINEAR PLENUM SLOT DIFFUSER FOR LAY-IN CEILINGS,PROVIDE 11" TALL EXTERNALLY INSULATED PLENUM. INSIDE OF PLENUM SHALL BE FLAT BLACK. PROVIDE MODEL "TRM" HARD CEILING TRIM FRAME FOR HARD CEILING APPLICATIONS. SEE PLANS FOR LENGTH AND INLET SIZE. SLOT SIZE AND COUNT ARE AS FOLLOWS:

4'-0" LONG		2'-0" LONG	
UP TO 100 CFM:	1" SLOT, 2 SLOTS (6"| INLET)	UP TO 75 CFM:	1" SLOT, 2 SLOTS (6"| INLET)
UP TO 200 CFM:	1" SLOT, 2 SLOTS (8"| INLET)	UP TO 125 CFM:	1" SLOT, 2 SLOTS (8"| INLET)
UP TO 300 CFM:	1" SLOT, 4 SLOTS (10"| INLET)	UP TO 175 CFM:	1" SLOT, 4 SLOTS (8"| INLET)
UP TO 400 CFM:	1" SLOT, 4 SLOTS (12"| INLET)	UP TO 225 CFM:	1" SLOT, 4 SLOTS (10"| INLET)

5. NOT USED.

6. ALUMINUM DOOR GRILLE, SIGHT-PROOF 77° BLADES ½" O.C., BLADES PARALLEL TO LONG DIMENSION. PROVIDE AUXILLIARY FRAME. FINISH SHALL BE ALUMINUM PAINT.

7. ADJUSTABLE MODULINEAR PLENUM SLOT DIFFUSER FOR LAY-IN CEILINGS (FRAME TYPE "9A"). 1" SLOTS. TYPE "X-X" FLANGED END BORDER. PROVIDE EXTERNALLY INSULATED PLENUMS (MODEL "MP-39") WHERE INDICATED (PLENUM LENGTH AS INDICATED ON PLANS, INSIDE SHALL BE FLAT BLACK). PROVIDE MODEL "BLKS" FLAT BALCK BLANK-OFF OVER UNUSED PORTIONS . SEE PLANS FOR LENGTH, SLOT COUNT AND PLENUM INLET SIZE. FIELD COORDINATE EXACT LENGTHS.

8. FOR LAY-IN CEILING (24/24 NOMINAL FRAME TYPE "3"). ROUND PANEL FACE. PROVIDE MOLDED INSULATED BLANKET. PROVIDE MODEL "TRM" TRIM FRAME FOR MOUNTING IN HARD CEILINGS.

EXHAUST TERMINAL BOXES

MARK	SERVES	INLET SIZE	MAX. CFM	MIN. CFM	MAX. A.P.D.	MAX. N.C.	REFERENCE PRODUCT
ET-49-1	WAITING 1D130 EXHAUST	14"Ø	1350	1000	0.07	20	TITUS ECV 1
ET-49-2	WAITING ISO 1D130D EXHAUST	8"Ø	500	250	0.09	20	TITUS ECV 1
ET-49-3	WAITING 1D130 EXHAUST	14"Ø	1350	1000	0.07	20	TITUS ECV 1
ET-49-4	ACUTE CARE / ISO EXHAUST	10"Ø	975	550	0.13	20	TITUS ECV 1
ET-49-5	ACUTE CARE / ISO EXHAUST	10"Ø	930	550	0.12	20	TITUS ECV 1
ET-49-6	ACUTE CARE / ISO EXHAUST	8"Ø	460	460	0.08	20	TITUS ECV 1
ET-49-7	1ST FLOOR GENERAL EXHAUST	20/16	2430	2430	0.25	20	TITUS QCV 1 2

1. VARIABLE AIR VOLUME, PRESSURE INDEPENDENT TERMINAL.
2. LISTED SIZE IS THE DAMPER SIZE ONLY. REFERENCE DRAWINGS FOR ACTUAL DUCT SIZE.

CONSTANT AIR VOLUME CONTROLLERS

MARK	SERVES	INLET SIZE	CFM	MAX. A.P.D.	N.C. @ 0.6" W.C. DP	REFERENCE PRODUCT
CAV 49-1	WOMEN 1D130C	5"Ø	100	0.20	<41	TROX RN125 1
CAV 49-2	TRIAGE 1 1D129	6"Ø	200	0.20	<39	TROX RN160 1 2
CAV 49-3	EXISTING (TELE. SIGNAL) 1 1D131A	6"Ø	200	0.20	<39	TROX RN160 1 2
CAV 49-4	TOILET 1D127B	5"Ø	100	0.20	<41	TROX RN125 1
CAV 49-5	TRIAGE 2 1D128	6"Ø	200	0.20	<39	TROX RN200 1 2
CAV 49-6	MENS 1D130B	5"Ø	100	0.20	<41	TROX RN125 1

1. CONSTANT AIR VOLUME, PRESSURE INDEPENDENT TERMINAL.
2. PROVIDE TRANSITION PIECE FOR U.S. DUCTWORK..

ELECTRIC HEATER

MARK	LOCATION	CFM	KW	ELECTRICAL DATA			MANUFACTURER	MODEL	REMARKS
				AMPS	VOLTS	Ø			
EH-1	CORRIDOR C170	175	0.75	6.25	120	1	MARKEL	E3321TD-RP	1

NOTES: 1. PROVIDE BUILT-IN TAMPER PROOF THERMOSTAT, DISCONNECT SWITCH, 4" SURFACE MOUNTING FRAME AND 16 GUAGE STEEL HEAVY DUTY GRILL.

CONSTRUCTION DOCUMENTS SUBMISSION
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Revisions: Date

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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9395 CHRISTOPHER R. BORNÉ 03/06/2015

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Drawing Title: HVAC SCHEDULES
Approved: Project Director
Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**
Location: **LITTLE ROCK, ARKANSAS**
Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ
Project Number: **CSI-112**
Building Number: 1
Drawing Number: MH603
Dwg. **105** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM
Department of Veterans Affairs

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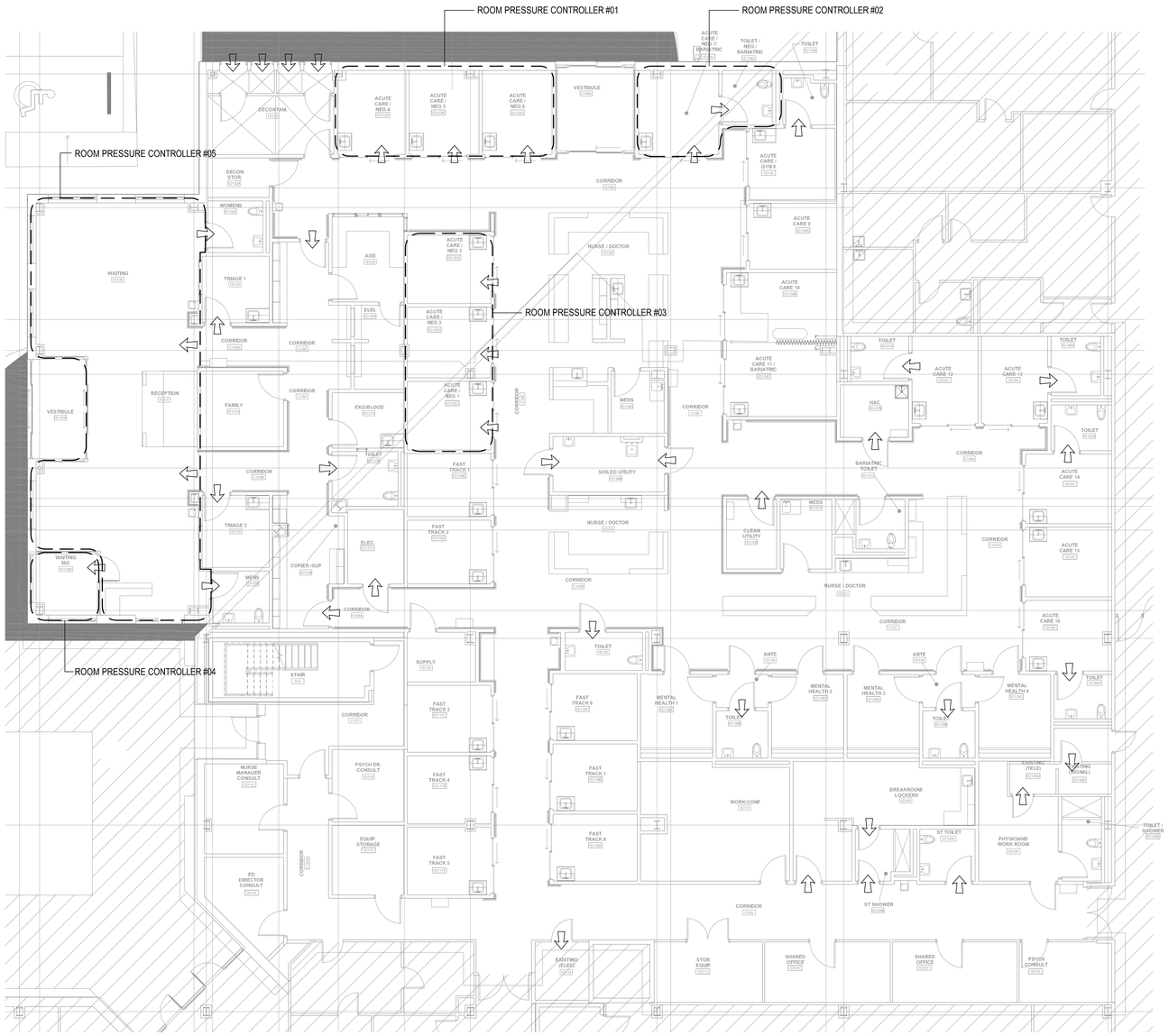
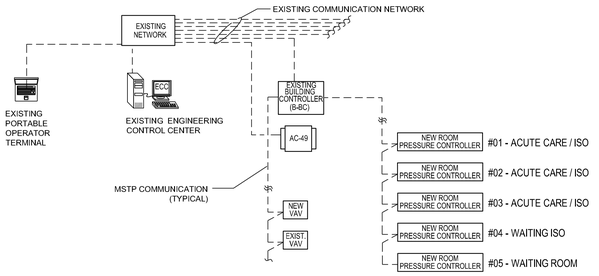
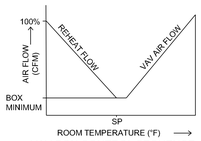


1 PRESSURE RELATIONSHIPS
NO SCALE



2 EXISTING EMCS ARCHITECTURE
NO SCALE



VAV BOX CONTROL SEQUENCE
NO DEADBAND

VAV COOLING ONLY SUPPLY AIR TERMINAL UNIT SEQUENCE OF OPERATION:

MODE OF OPERATION:
THE SUPPLY AIR TERMINAL UNIT MODE OF OPERATION SHALL BE OCCUPIED, STANDBY, OR UNOCCUPIED BASED ON A SCHEDULE COMMUNICATED FROM THE EMS, AN OPERATOR OVERRIDE COMMAND FROM THE EMS, AN OVERRIDE FROM THE SPACE OCCUPANCY SENSOR, OR AN OCCUPANCY OVERRIDE SIGNAL FROM THE SPACE TEMPERATURE SENSOR OVERRIDE PUSHBUTTON.

OCCUPIED MODE:
THE SPACE TEMPERATURE SETPOINT SHALL BE ADJUSTABLE BY THE OCCUPANT AT THE THERMOSTAT BETWEEN A MINIMUM OF 68°F AND A MAXIMUM OF 75°F. THE TERMINAL UNIT PRIMARY AIR DAMPER OCCUPIED MINIMUM AIRFLOW AND OCCUPIED MAXIMUM AIRFLOW ARE AS SCHEDULED.

TERMINAL UNIT OPERATION:
ON AN INCREASE IN SPACE TEMPERATURE ABOVE THE SPACE COOLING SETPOINT, THE SUPPLY AIR TERMINAL UNIT PRIMARY AIR DAMPER SHALL BE MODULATED BETWEEN THE COOLING MINIMUM AND THE COOLING MAXIMUM AIR FLOW RATES TO SATISFY THE COOLING DEMAND BASED ON THE MODE OF OPERATION. ON A DECREASE IN SPACE TEMPERATURE BELOW THE SPACE COOLING SETPOINT, THE SUPPLY AIR TERMINAL UNIT PRIMARY AIR DAMPER SHALL MAINTAIN THE COOLING MINIMUM AIR FLOW RATES BASED ON THE MODE OF OPERATION.

SETPOINTS AND PARAMETERS:
ALL CONTROL BANDS, SETPOINTS, SETPOINT LIMITS, SETPOINT INCREMENT VALUES, SETPOINT DECREMENT VALUES, TIME DELAYS, AND OTHER PARAMETERS SHALL BE ADJUSTABLE FROM THE EMS. ALL PARAMETERS SHALL BE COMMISSIONED BY THE ATC CONTRACTOR TO PROVIDE STABLE CONTROL OF ALL SYSTEMS.

ALARM MONITORING:
AN ALARM WILL BE GENERATED AT THE EMS PC WORKSTATION IF ANY OF THE FOLLOWING OCCUR:

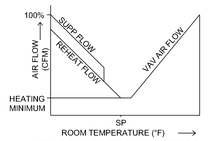
1. HIGH LEAVING AIR TEMPERATURE
2. LOW LEAVING AIR TEMPERATURE
3. SPACE HIGH TEMPERATURE ALARM
4. SPACE LOW TEMPERATURE ALARM
5. LOW AIRFLOW ALARM
6. HIGH AIRFLOW ALARM

A. SET POINTS SHALL BE SET AS FOLLOWS:
COOLING 72°F (ADJ.)

HEATING N/A

B. UPON FALL IN SPACE TEMPERATURE THE VAV DAMPER WILL MODULATE TO MINIMUM POSITION.

C. THE REVERSE SHALL OCCUR ON THE RISE IN SPACE TEMPERATURE.



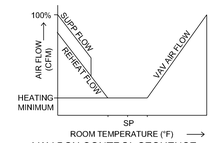
VAV BOX CONTROL SEQUENCE
NO DEADBAND

SEQUENCE OF OPERATIONS:

AIR TERMINAL MODE OF OPERATION IS EITHER "OCCUPIED" OR "UNOCCUPIED" BASED UPON STATUS OF ROOM LIGHTING ("OCCUPIED" WHEN LIGHTS ARE "ON" AND "UNOCCUPIED" WHEN LIGHTS ARE "OFF").

DURING THE "OCCUPIED" MODE OF OPERATION, THE SPACE TEMPERATURE SETPOINT SHALL BE ADJUSTABLE BY THE OCCUPANT AT THE THERMOSTAT BETWEEN A MINIMUM OF 68 DEG. F (ADJUSTABLE) AND A MAXIMUM OF 75 DEG. F (ADJUSTABLE). THE COOLING SETPOINT SHALL BE EQUAL TO THE SPACE TEMPERATURE SETPOINT PLUS 1.0 DEG. F (ADJUSTABLE). THE HEATING SETPOINT SHALL BE EQUAL TO THE SPACE TEMPERATURE SETPOINT MINUS 1.0 DEG. F (ADJUSTABLE). ON A CALL FOR COOLING, THE TERMINAL DAMPER SHALL BE MODULATED BETWEEN THE COOLING MINIMUM AND THE COOLING MAXIMUM AIR FLOW SETPOINTS AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE AT THE COOLING SETPOINT. MINIMUM COOLING AIR FLOW SETPOINT SHALL BE AUTOMATICALLY RESET AS REQUIRED TO MAINTAIN THE SPACE CO2 CONCENTRATION AT SETPOINT OF 1,000 PPM (ADJUSTABLE). ON A CALL FOR HEATING, THE TERMINAL DAMPER SHALL BE MODULATED BETWEEN THE HEATING MINIMUM AND THE HEATING MAXIMUM AIR FLOW SETPOINTS AND THE HEATING WATER CONTROL VALVE SHALL BE MODULATED OPEN AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE AT THE HEATING SETPOINT.

DURING THE "UNOCCUPIED" MODE OF OPERATION, THE HEATING SETPOINT SHALL BE 60 DEG. F (ADJUSTABLE) AND THE COOLING SETPOINT SHALL BE 85 DEG. F (ADJUSTABLE). ON A CALL FOR COOLING, THE TERMINAL DAMPER SHALL BE MODULATED FROM FULLY CLOSED (0 CFM) TO THE MAXIMUM COOLING AIR FLOW SETPOINT AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE AT THE COOLING SETPOINT. ON A CALL FOR HEATING, THE TERMINAL DAMPER SHALL BE MODULATED BETWEEN THE MINIMUM HEATING AND THE MAXIMUM HEATING AIR FLOW SETPOINTS AND THE HEATING WATER CONTROL VALVE SHALL BE MODULATED OPEN AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE AT THE HEATING SETPOINT.



VAV BOX CONTROL SEQUENCE
W/DEADBAND

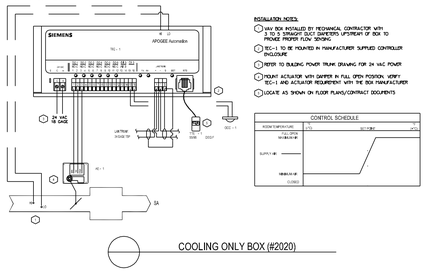
A. SET POINTS SHALL BE SET AS FOLLOWS:
COOLING 72°F (ADJ.)
HEATING 70°F(ADJ.)
DEADBAND OF 5° F BETWEEN HEATING AND COOLING SET POINTS WILL BE MAINTAINED.

B. UPON FALL IN SPACE TEMPERATURE THE VAV DAMPER WILL MODULATE TO MINIMUM POSITION.

C. UPON FURTHER DROP IN SPACE TEMPERATURE VALVE V-1 WILL MODULATE TO MAINTAIN SET POINT ± .5° F. THE ADJUSTABLE TOLERANCE OF + .5° F HAS BEEN SELECTED TO PREVENT VALVE HUNTING.

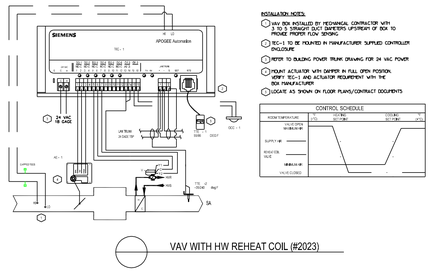
D. VALVE V-2 SHALL BE ENABLED WHEN OUTSIDE AIR FALLS BELOW 40° F (ADJ.) AND VALVE V-1 HAS BEEM MODULATED OPEN ABOVE 30% (ADJ). VALVE V-2 SHALL MAINTAIN SET POINT ± .5° F. THE ADJUSTABLE TOLERANCE OF + .5°F HAS BEEN SELECTED TO PREVENT VALVE HUNTING.

E. THE REVERSE SHALL OCCUR ON THE RISE IN SPACE TEMPERATURE.



COOLING ONLY BOX (#2020)

NO SUPPLEMENTAL HEATING



VAV WITH HW REHEAT COIL (#2023)

WITH SUPPLEMENTAL HEATING

3 VARIABLE VOLUME AIR TERMINAL UNIT CONTROL DIAGRAM
NO SCALE

CONSTRUCTION DOCUMENTS SUBMISSION
FULLY SPRINKLERED

Revisions: Date

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08-06-2015

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Drawing Title: HVAC CONTROLS PLAN

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**

Building Number: 1

Drawing Number: MH701

Dwg. **106** of **127**

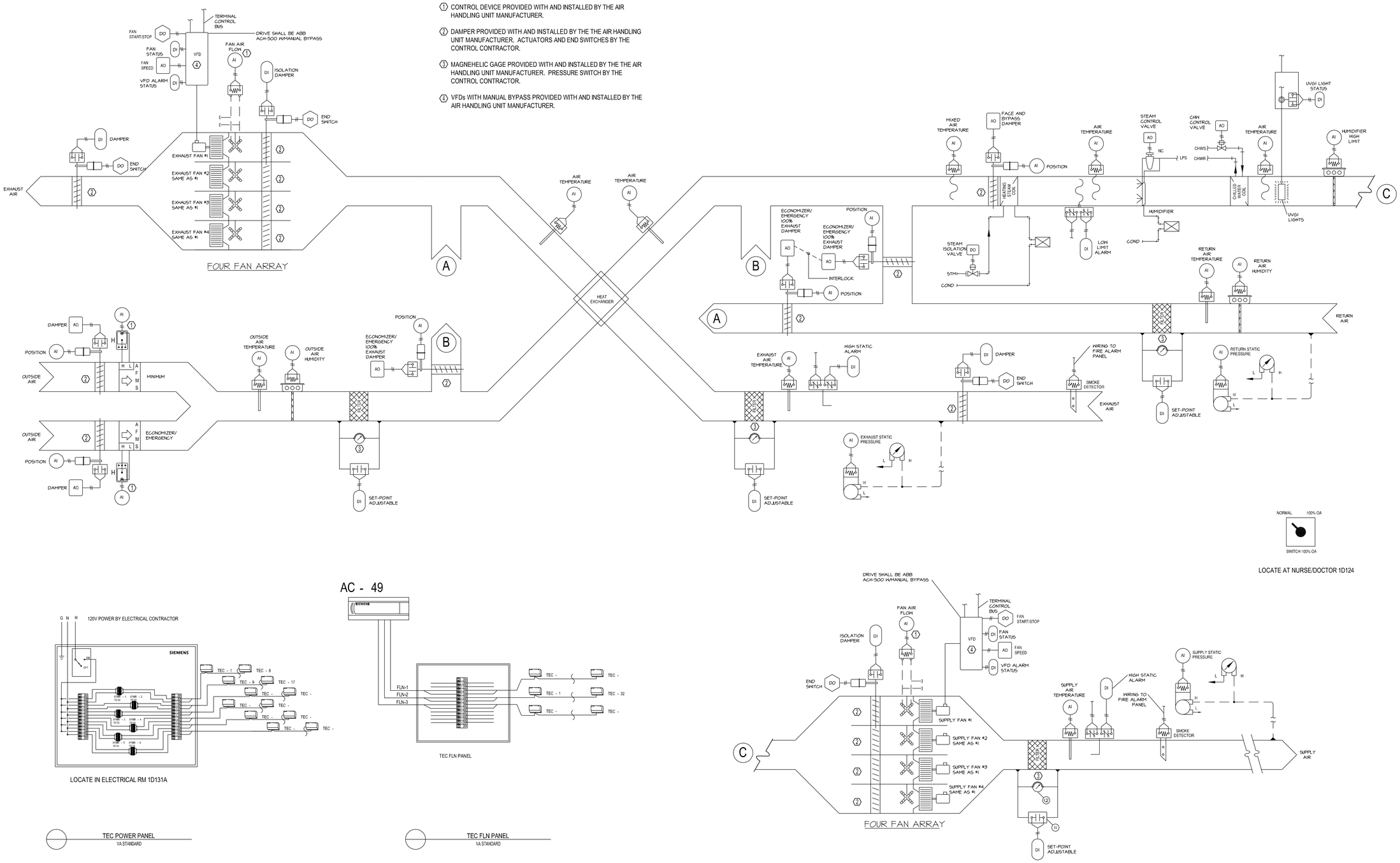
CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

VA FORM 08-6231 8/28/2014 2:15:40 PM

KEYED NOTES:

1. CONTROL DEVICE PROVIDED WITH AND INSTALLED BY THE AIR HANDLING UNIT MANUFACTURER.
2. DAMPER PROVIDED WITH AND INSTALLED BY THE THE AIR HANDLING UNIT MANUFACTURER. ACTUATORS AND END SWITCHES BY THE CONTROL CONTRACTOR.
3. MAGNEHELIC GAGE PROVIDED WITH AND INSTALLED BY THE THE AIR HANDLING UNIT MANUFACTURER. PRESSURE SWITCH BY THE CONTROL CONTRACTOR.
4. VFDs WITH MANUAL BYPASS PROVIDED WITH AND INSTALLED BY THE AIR HANDLING UNIT MANUFACTURER.



TEC POWER PANEL
VA STANDARD

TEC FLN PANEL
VA STANDARD

1 VAV AIR HANDLING UNIT (AC-49) - EMERGENCY DEPARTMENT / MENTAL HEALTH

NO SCALE

(SEE SHEET MH703 FOR AC-49 SEQUENCE OF OPERATION)

CONSTRUCTION DOCUMENTS SUBMISSION
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Revisions: | Date

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Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**
Building Number: 1
Drawing Number: MH702
Dwg. **107** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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AIR HANDLING UNIT AHU-49 SEQUENCE OF OPERATION:

MODE OF OPERATION:
THE AIR HANDLING UNIT MODE OF OPERATION SHALL BE EITHER OCCUPIED AT ALL TIMES.

MODE OF OPERATION:
THE SUPPLY FAN(S) SHALL OPERATE CONTINUOUSLY.

ON PROOF OF SUPPLY FAN OPERATION, THE OUTSIDE AND RETURN AIR CONTROL DAMPERS MODULATE AS REQUIRED TO MAINTAIN THE SCHEDULED OUTSIDE AIRFLOW FOR VENTILATION.

THE SUPPLY FAN(S) VARIABLE FREQUENCY DRIVE(S) SHALL STAGE SUPPLY FANS AND MODULATE THE SUPPLY FAN SPEED TO MAINTAIN THE SUPPLY AIR STATIC PRESSURE SETPOINT. INITIAL SETPOINT ON TRANSITION FROM UNOCCUPIED TO OCCUPIED OPERATION SHALL BE 1.5 INCHES WATER GAUGE. WHEN THE EMS DETERMINES AN ADDITIONAL FAN IS REQUIRED TO MAINTAIN FLOW AND/OR STATIC PRESSURE: (1) THE NEXT FAN IN THE SEQUENCE SHALL BE STARTED AND RAMPED TO 30% SPEED (ADJUSTABLE), (2) THE FAN ISOLATION DAMPER SHALL BE OPENED, AND (3) UPON PROOF OF DAMPER OPENING THE FAN SHALL BE RELEASED TO MODULATE SPEED AUTOMATICALLY.

THE SUPPLY STATIC PRESSURE SHALL RESET BASED THE CRITICAL ZONE DAMPER POSITION. THE EMS SHALL MONITOR THE DAMPER POSITION OF ALL VAV TERMINAL UNITS AND DETERMINE THE VAV AHU CRITICAL ZONE VAV TERMINAL UNIT (CZ). THE AHU CRITICAL ZONE (CZ) VAV TERMINAL UNIT SERVED BY THE AHU WITH THE MOST OPEN DAMPER. THE STATIC PRESSURE SETPOINT SHALL BE RESET BETWEEN 0.5 TO 2.5 INCHES WATER GAUGE TO OPTIMIZE FAN ENERGY.

WHEN THE CZ DAMPER IS LESS THAN 85% OPEN, THE SUPPLY FAN DISCHARGE STATIC PRESSURE SETPOINT SHALL BE RESET DOWNWARD BY 10% OF THE PREVIOUS SETPOINT AT A FREQUENCY OF 10 MINUTES UNTIL THE CZ DAMPER IS MORE THAN 90% OPEN OR THE STATIC PRESSURE SETPOINT HAS RESET DOWNWARD TO THE SYSTEM MINIMUM SETTING.

WHEN THE CZ DAMPER IS MORE THAN 95% OPEN, THE SUPPLY STATIC PRESSURE SETPOINT SHALL BE RESET UPWARD BY 10% OF THE PREVIOUS SETPOINT AT A FREQUENCY OF 5 MINUTES UNTIL THE CZ DAMPER IS MORE THAN 90% OPEN OR THE STATIC PRESSURE SETPOINT HAS RESET UPWARD TO THE SYSTEM MAXIMUM SETTING.

VAV TERMINAL UNIT(S) SERVED BY THE AIR HANDLING UNIT SHALL BE CAPABLE OF BEING EXCLUDED FROM THE STATIC PRESSURE OPTIMIZATION CALCULATIONS TO ALLOW FOR VAV TERMINAL UNITS THAT SERVE AREAS THAT ARE CONSTANT VOLUME OR REQUIRE FULL COOLING AT ALL TIMES.

THE EXHAUST SYSTEM FANS AND TERMINAL UNITS SHALL OPERATE IN A SIMILAR MANNER TO THE SUPPLY SYSTEM.

THE CHILLED WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SUPPLY AIR TEMPERATURE AT THE SUPPLY AIR TEMPERATURE SETPOINT. THE SUPPLY AIR TEMPERATURE SETPOINT SHALL BE RESET BETWEEN 55°F TO 60°F BY THE SUPPLY AIR TEMPERATURE AND STATIC PRESSURE SETPOINT OPTIMIZATION CALCULATIONS.THE INITIAL SUPPLY AIR TEMPERATURE SETPOINT AT TRANSITION FROM UNOCCUPIED TO OCCUPIED OPERATION SHALL BE 55°F.

THE HUMIDIFIER SHALL BE MODULATED TO MAINTAIN RETURN AIR HUMIDITY AT SETPOINT OF 30% RH (ADJUSTABLE). THE HUMIDITY HIGH LIMIT SENSOR SHALL MODULATE THE HUMIDIFIER TO MAINTAIN A MAXIMUM OF 90% RH LEAVING AIR HUMIDITY FROM THE HUMIDIFIER. THE HUMIDITY HIGH LIMIT SHALL BE LOCATED THE MANUFACTURER RECOMMENDED DISTANCE DOWNSTREAM OF THE HUMIDIFIERS.

THE PREHEAT CONTROL VALVE SHALL MODULATE TO MAINTAIN THE MINIMUM PREHEAT DISCHARGE AIR TEMPERATURE AT 53°F SETPOINT WHEN MIXED AIR TEMPERATURE IS ABOVE 40°F. WHEN MIXED AIR TEMPERATURE IS BELOW 38°F, THE PREHEAT CONTROL VALVE SHALL BE FULL OPEN TO THE COIL AND THE FACE AND BYPASS DAMPERS SHALL MODULATE TO MAINTAIN THE MINIMUM PREHEAT DISCHARGE AIR TEMPERATURE AT 53°F SETPOINT.

THE CONTROL BANDS, SETPOINT INCREMENT VALUES, SETPOINT DECREMENT VALUES AND ADJUSTMENT FREQUENCIES SHALL BE ADJUSTED TO MAINTAIN MAXIMUM STATIC PRESSURE OPTIMIZATION WITH STABLE SYSTEM CONTROL AND MAXIMUM COMFORT CONTROL. ALL PARAMETERS INCLUDING SETPOINTS LIMITS SHALL BE ADJUSTABLE FROM THE EMS.

ECONOMIZER OPERATION
THE HEAT EXCHANGER BYPASS DAMPER, THE RETURN DAMPER AND THE RELIEF DAMPER SHALL BE MODULATED TO MAINTAIN A MIXED AIR TEMPERATURE OF 53°F (ADJUSTABLE).

SAFETIES IN ALL MODES OF OPERATION:
IN THE EVENT THE FIRE ALARM RELAY INDICATES AN UNSAFE CONDITION, THE SUPPLY FAN(S) SHALL STOP AND AN ALARM SHALL BE GENERATED AT THE EMS OPERATOR WORKSTATION.

IN THE EVENT THE STATIC PRESSURE EXCEEDS THE HIGH STATIC LIMIT SWITCH (HSL) SETPOINT OF 4.0 INCHES WATER GAUGE, THE SUPPLY FAN(S) SHALL STOP AND AN ALARM SHALL BE GENERATED AT THE EMS OPERATOR WORKSTATION. THE SWITCH SHALL REQUIRE MANUAL RESET. THE SETPOINT IS ADJUSTABLE AT THE SWITCH.

IN THE EVENT THE TEMPERATURE DROPS BELOW THE TEMPERATURE LOW LIMIT SAFETY (TLL) SETPOINT OF 40°F, THE SUPPLY FAN SHALL STOP. THE CHILLED WATER CONTROL VALVE SHALL BE FULLY OPEN, AND THE PREHEAT CONTROL VALVE SHALL BE FULLY OPENED TO THE COIL AND THE FACE/BYPASS DAMPERS SHALL BE FULL OPEN TO THE PREHEAT COIL. AN ALARM SHALL BE GENERATED AT THE EMS OPERATOR WORKSTATION INDICATING THE LOW TEMPERATURE CONDITION. THE TEMPERATURE LOW LIMIT SWITCH SHALL REQUIRE MANUAL RESET. THE SETPOINT IS ADJUSTABLE AT THE SWITCH.

FILTERS:
THE DDC PANEL SHALL MONITOR FILTER DIFFERENTIAL PRESSURE AND DISPLAY THE PRESSURE DROP ON THE EMS. AN ALARM SHALL BE GENERATED AT THE EMS WHEN FILTER DIFFERENTIAL PRESSURE EXCEEDS THE DIRTY FILTER ALARM SETPOINT. THE FILTER DIFFERENTIAL PRESSURE ALARM SETPOINT SHALL BE ADJUSTABLE AT THE EMS.

SETPOINTS AND PARAMETERS:
ALL CONTROL BANDS, SETPOINTS, SETPOINT LIMITS, SETPOINT INCREMENT VALUES, SETPOINT DECREMENT VALUES, TIME DELAYS, EQUIPMENT ROTATION SEQUENCES, AND OTHER PARAMETERS SHALL BE ADJUSTABLE FROM THE EMS.

ALL PARAMETERS SHALL BE COMMISSIONED BY THE ATC CONTRACTOR TO PROVIDE STABLE CONTROL OF ALL SYSTEMS.

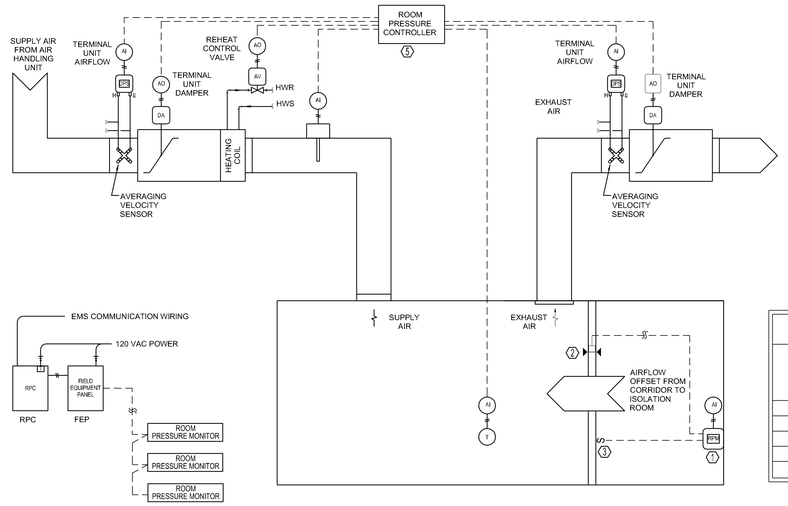
ALARM MONITORING:
AN ALARM WILL BE GENERATED AT THE EMS PC WORKSTATION IF ANY OF THE FOLLOWING OCCUR:

1. FAN FAILURE (ALL FANS)
2. LOW SUPPLY AIR TEMPERATURE
3. HIGH SUPPLY AIR TEMPERATURE
4. SPACE HIGH TEMPERATURE
5. SPACE LOW TEMPERATURE
6. LOW RETURN AIR HUMIDITY
7. HIGH RETURN AIR HUMIDITY
8. FILTER PRESSURE DROP HAS EXCEEDED ALLOWABLE LIMITS
9. HIGH STATIC PRESSURE SAFETY ALARM
10. TEMPERATURE LOW LIMIT SAFETY ALARM
11. FIRE ALARMS SAFETY ALARM
12. LOW OSA (FLOW NOT MET)
13. LOW / HIGH MIXED AIR TEMP.
14. LOW / HIGH PREHEAT TEMP.
15. DUCT STATIC PRESSURE NOT MET FOR 15 MINUTES (SUPPLY, RETURN AND EXHAUST)

SYSTEM GRAPHIC:

A GRAPHIC REPRESENTATION OF THE SYSTEM SHALL BE PROVIDED AT THE EMS PC OPERATOR WORKSTATION WITH, AT A MINIMUM. ALL POINTS SHOWN ON THE CONTROL DIAGRAM. ANALOG VALUES SHALL BE DISPLAYED WITH DYNAMIC SENSOR DATA UPDATED TO CURRENT SENSED VALUES AT A MAXIMUM OF 20 SECOND INTERVALS. BINARY VALUES WILL UPDATE WITHIN 20 SECONDS OF A CHANGE OF STATE IN THE VALUE. SETPOINTS SHALL BE DISPLAYED ON THE SYSTEMS GRAPHIC AND ALLOW ADJUSTMENT FROM THE SYSTEM GRAPHIC. GRAPHIC WILL BE LINKED TO THE BUILDING FLOOR PLAN GRAPHIC.

1 SEQUENCE OF OPERATION FOR VAV AIR HANDLING UNIT (AC-49) - EMERGENCY DEPARTMENT / MENTAL HEALTH
NO SCALE



KEYED NOTES:

1. SIEMENS MODEL 547-002 ROOM PRESSURE MONITOR (RPM). PROVIDE ONE FOR EACH ROOM SERVED BY ISOLATION SYSTEM.
2. REMOTE PRESSURE TRANSMITTER. TRANSMITTER MAY BE LOCATED UP TO 500 FT FROM THE RPM.
3. DOOR SWITCH TO DISABLE PRESSURE ALARM WHEN DOOR IS OPEN.
4. TO ROOM PRESSURE CONTROLLER (RPC).
5. PROVIDE AUTOZERO MODULES.

ROOM PRESSURE CONTROLLER (RPC) SCHEDULE

RPC ZONE #	VAV SUPPLY TERMINAL	VAV EXHAUST TERMINAL	ROOM(S) SERVED	RPM COUNT	RPC MODEL NO.
01	VAV 49-1	ET-49-4	1D33A, 1D33B, 1D33C	3	SIEMENS 540-517
02	VAV-49-11	ET-49-5	1D25C, AD25D, 1D25E	3	SIEMENS 540-517
03	VAV-49-16	ET-49-2	1D130D	1	SIEMENS 540-517
04	VAV-49-24	ET-49-6	1D134	1	SIEMENS 540-517

2 ISOLATION ROOM CONTROL DIAGRAM
NO SCALE

ISOLATION ROOM SEQUENCE OF OPERATION

THE DDC SHALL BE REPROGRAMMED SUCH THAT THE ROOM THERMOSTAT AND OCCUPANCY SENSOR SHALL BE USED TO CONTROL EACH THE TERMINAL UNIT.

NORMAL MODES OF OPERATION:

NORMAL MODES OF OPERATION ARE EITHER OCCUPIED OR UNOCCUPIED AS DETERMINED BY OCCUPANCY SENSOR OR MANUAL COMMAND AT THE EMS. WHEN OCCUPANCY SENSOR INDICATES THAT THE ROOM IS OCCUPIED, MODE OF OPERATION SHALL BE OCCUPIED. WHEN OCCUPANCY SENSOR INDICATES THAT THE ROOM IS UNOCCUPIED, MODE OF OPERATION SHALL REMAIN OCCUPIED FOR 30 MINUTES (ADJUSTABLE). AFTER THE TIME DELAY HAS ELAPSED, THE MODE OF OPERATION SHALL BE UNOCCUPIED.

HEATING AND COOLING SETPOINTS:

SPACE TEMPERATURE SETPOINT SHALL BE ADJUSTABLE AT THE THERMOSTAT FROM A MINIMUM OF 68ºF TO A MAXIMUM OF 75ºF. UNOCCUPIED COOLING SETPOINT SHALL BE EQUAL TO 75ºF AND THE UNOCCUPIED HEATING SETPOINT SHALL BE EQUAL TO 60ºF.

OCCUPIED MODE:

IN THE OCCUPIED MODE, THE TERMINAL UNIT SHALL BE MODULATED BETWEEN MAXIMUM AND MINIMUM AIRFLOWS AS SCHEDULED ON THE DRAWINGS. THE TERMINAL UNIT HEATING WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SPACE TEMPERATURE AT THE OCCUPIED SETPOINT. THE EXHAUST AIR TERMINAL UNIT SHALL BE MODULATED TO MAINTAIN AN OVERALL AIRFLOW DIFFERENTIAL OF 90 CFM (ADJUSTABLE) THE MINIMUM ISOLATION ROOM SPACE PRESSURE NEGATIVE RELATIVE TO THE CORRIDOR SHALL BE 0.02 INCHES W.G. (ADJUSTABLE)

UNOCCUPIED MODE:

MINIMUM SUPPLY CFM SHALL BE REDUCED TO BOX CONTROLLABLE MINIMUM. AIRFLOW DIFFERENTIAL SHALL BE MAINTAINED AS IN PCCUPIED MODE.

SETPONTS AND PARAMETERS:

ALL CONTROL BANDS, SETPOINTS, SETPOINT LIMITS, SETPOINT INCREMENT VALUES, SETPOINT DECREMENT VALUES, TIME DELAYS, EQUIPMENT ROTATION SEQUENCES, ALARM LIMITS, AND OTHER PARAMETERS SHALL BE ADJUSTABLE FROM THE EMS. ALL PARAMETERS SHALL BE PROVED BY THE ATC CONTRACTOR TO PROVIDE STABLE CONTROL OF ALL SYSTEMS.

ALARM MONITORING:

AN ALARM WILL BE GENERATED AT THE EMS PC WORKSTATION IF ANY OF THE FOLLOWING OCCUR:
A. ISOLATION ROOM DIFFERENTIAL PRESSURE DROPS BELOW 0.02 INCHES W.G. FOR GREATER THAN 30 SECONDS.

SYSTEM GRAPHIC:

A GRAPHIC REPRESENTATION OF THE SYSTEM SHALL BE PROVIDED AT THE EMS PC OPERATOR WORKSTATION WITH, AT A MINIMUM, ALL POINTS SHOWN ON THE CONTROL DIAGRAM. ANALOG VALUES SHALL BE DISPLAYED WITH DYNAMIC SENSOR DATA UPDATED TO CURRENT SENSED VALUES AT A MAXIMUM OF 20 SECOND INTERVALS. BINARY VALUES WILL UPDATE WITHIN 20 SECONDS OF A CHANGE OF STATE IN THE VALUE. SETPOINTS SHALL BE DISPLAYED ON THE SYSTEMS GRAPHIC AND ALLOW ADJUSTMENT FROM THE SYSTEM GRAPHIC. GRAPHIC WILL BE LINKED TO THE BUILDING FLOOR PLAN GRAPHIC.

3 SEQUENCE OF OPERATION - ISOLATION ROOMS
NO SCALE

CONSTRUCTION DOCUMENTS SUBMISSION
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Revisions: Date

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Drawing Title: HVAC CONTROLS PLAN

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**
Building Number: 1
Drawing Number: MH703
Dwg. **108** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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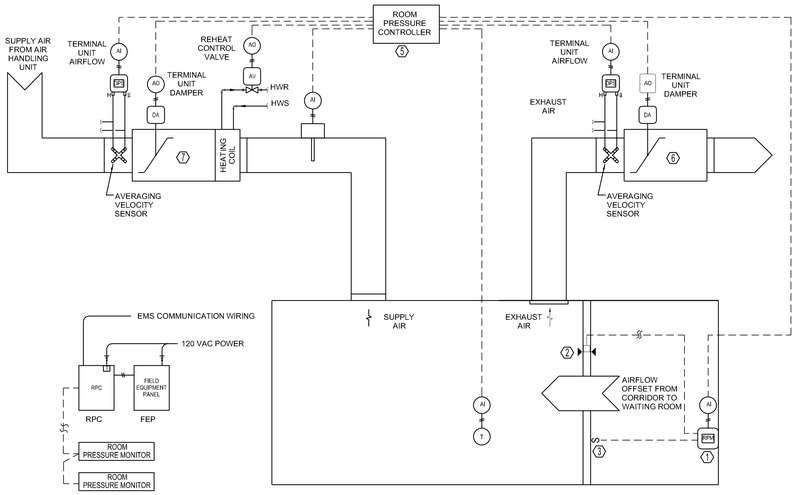


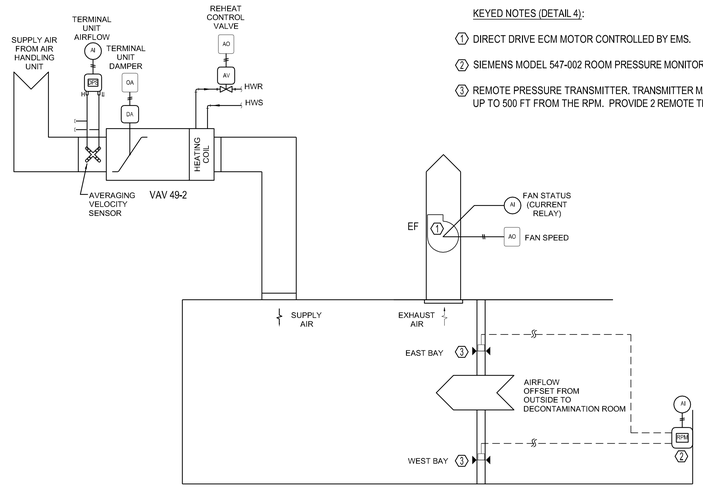
KEYED NOTES (DETAIL "1"):

1. SIEMENS MODEL 547-002 ROOM PRESSURE MONITOR (RPM). PROVIDE ONE AT EACH CORRIDOR DOOR (2 TOTAL).
2. REMOTE PRESSURE TRANSMITTER. TRANSMITTER MAY BE LOCATED UP TO 500 FT FROM THE RPM.
3. DOOR SWITCH TO DISABLE PRESSURE ALARM WHEN DOOR IS OPEN.
4. TO ROOM PRESSURE CONTROLLER (RPC).
5. PROVIDE AUTOZERO MODULES.
6. TYPICAL 2 EXHAUST TERMINALS.
7. TYPICAL 3 SUPPLY TERMINALS.

ROOM PRESSURE CONTROLLER (RPC) SCHEDULE

RPC ZONE #	VAV SUPPLY TERMINAL	VAV EXHAUST TERMINAL	ROOM(S) SERVED	RPM COUNT	RPC MODEL NO.
05	VAV 49-3 VAV-49-4 VAV-29-5	ET-49-1 ET-49-3	1D30, 1D31	2	SIEMENS PXC - ???

1 WAITING ROOM CONTROL DIAGRAM
NO SCALE



KEYED NOTES (DETAIL 4):

1. DIRECT DRIVE ECM MOTOR CONTROLLED BY EMS.
2. SIEMENS MODEL 547-002 ROOM PRESSURE MONITOR (RPM).
3. REMOTE PRESSURE TRANSMITTER. TRANSMITTER MAY BE LOCATED UP TO 500 FT FROM THE RPM. PROVIDE 2 REMOTE TRANSMITTERS.

4 DECONTAMINATION ROOM CONTROL DIAGRAM
NO SCALE

WAITING ROOM SEQUENCE OF OPERATION

THE DDC SHALL BE REPROGRAMMED SUCH THAT THE ROOM THERMOSTAT AND OCCUPANCY SENSOR SHALL BE USED TO CONTROL EACH THE TERMINAL UNIT.

NORMAL MODES OF OPERATION:

NORMAL MODES OF OPERATION ARE EITHER OCCUPIED OR UNOCCUPIED AS DETERMINED BY OCCUPANCY SENSOR OR MANUAL COMMAND AT THE EMS. WHEN OCCUPANCY SENSOR INDICATES THAT THE WAITING ROOM IS OCCUPIED, MODE OF OPERATION SHALL BE OCCUPIED. WHEN OCCUPANCY SENSOR INDICATES THAT THE ROOM IS UNOCCUPIED, MODE OF OPERATION SHALL REMAIN OCCUPIED FOR 30 MINUTES (ADJUSTABLE). AFTER THE TIME DELAY HAS ELAPSED, THE MODE OF OPERATION SHALL BE UNOCCUPIED.

HEATING AND COOLING SETPOINTS:

SPACE TEMPERATURE SETPOINT SHALL BE ADJUSTABLE AT THE THERMOSTAT FROM A MINIMUM OF 68ºF TO A MAXIMUM OF 75ºF. UNOCCUPIED COOLING SETPOINT SHALL BE EQUAL TO 75ºF AND THE UNOCCUPIED HEATING SETPOINT SHALL BE EQUAL TO 60ºF.

OCCUPIED MODE:

IN THE OCCUPIED MODE, THE TERMINAL UNIT SHALL BE MODULATED BETWEEN MAXIMUM AND MINIMUM AIRFLOWS AS SCHEDULED ON THE DRAWINGS. THE TERMINAL UNIT HEATING WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SPACE TEMPERATURE AT THE OCCUPIED SETPOINT. THE VAV SUPPLY AIRFLOW SHALL BE SUMMED AND THE EXHAUST AIR TERMINAL UNITS SHALL BE MODULATED TO MAINTAIN AN OVERALL AIRFLOW DIFFERENTIAL OF 200 CFM (ADJUSTABLE) THE MINIMUM WAITING ROOM SPACE PRESSURE NEGATIVE RELATIVE TO THE CORRIDOR SHALL BE 0.02 INCHES W.G. (ADJUSTABLE). CONSTANT AIR VOLUME TERMINAL (MECHANICAL FLOW DEVICES) SHALL HAVE THEIR FLOW RATES FIGURED INTO TOTAL EXHAUST AS A FIXED NUMBER.

UNOCCUPIED MODE:

MINIMUM SUPPLY CFM SHALL BE REDUCED TO BOX CONTROLLABLE MINIMUM. AIRFLOW DIFFERENTIAL SHALL BE MAINTAINED AS IN PCCUPIED MODE.

SETPONTS AND PARAMETERS:

ALL CONTROL BANDS, SETPOINTS, SETPOINT LIMITS, SETPOINT INCREMENT VALUES, SETPOINT DECREMENT VALUES, TIME DELAYS, EQUIPMENT ROTATION SEQUENCES, ALARM LIMITS, AND OTHER PARAMETERS SHALL BE ADJUSTABLE FROM THE EMS. ALL PARAMETERS SHALL BE PROVED BY THE ATC CONTRACTOR TO PROVIDE STABLE CONTROL OF ALL SYSTEMS.

ALARM MONITORING:

AN ALARM WILL BE GENERATED AT THE EMS PC WORKSTATION IF ANY OF THE FOLLOWING OCCUR:
A. WAITING ROOM DIFFERENTIAL PRESSURE DROPS BELOW 0.02 INCHES W.G. FOR GREATER THAN 30 SECONDS.

SYSTEM GRAPHIC:

A GRAPHIC REPRESENTATION OF THE SYSTEM SHALL BE PROVIDED AT THE EMS PC OPERATOR WORKSTATION WITH, AT A MINIMUM, ALL POINTS SHOWN ON THE CONTROL DIAGRAM. ANALOG VALUES SHALL BE DISPLAYED WITH DYNAMIC SENSOR DATA UPDATED TO CURRENT SENSED VALUES AT A MAXIMUM OF 20 SECOND INTERVALS. BINARY VALUES WILL UPDATE WITHIN 20 SECONDS OF A CHANGE OF STATE IN THE VALUE. SETPOINTS SHALL BE DISPLAYED ON THE SYSTEMS GRAPHIC AND ALLOW ADJUSTMENT FROM THE SYSTEM GRAPHIC. GRAPHIC WILL BE LINKED TO THE BUILDING FLOOR PLAN GRAPHIC.

2 SEQUENCE OF OPERATION - WAITING ROOM
NO SCALE

DECONTAMINATION ROOM SEQUENCE OF OPERATION

THE DDC SHALL BE REPROGRAMMED SUCH THAT THE ROOM THERMOSTAT AND OCCUPANCY SENSOR SHALL BE USED TO CONTROL EACH THE TERMINAL UNIT. THE EMS SHALL CONTROL THE EXHAUST FAN SPEED.

NORMAL MODES OF OPERATION:

NORMAL MODES OF OPERATION ARE EITHER OCCUPIED OR UNOCCUPIED AS DETERMINED BY OCCUPANCY SENSOR OR MANUAL COMMAND AT THE EMS. WHEN OCCUPANCY SENSOR INDICATES THAT THE DECONTAMINATION ROOM IS OCCUPIED, MODE OF OPERATION SHALL BE OCCUPIED. WHEN OCCUPANCY SENSOR INDICATES THAT THE ROOM IS UNOCCUPIED, MODE OF OPERATION SHALL REMAIN OCCUPIED FOR 30 MINUTES (ADJUSTABLE). AFTER THE TIME DELAY HAS ELAPSED, THE MODE OF OPERATION SHALL BE UNOCCUPIED.

HEATING AND COOLING SETPOINTS:

SPACE TEMPERATURE SETPOINT SHALL BE ADJUSTABLE AT THE THERMOSTAT FROM A MINIMUM OF 68ºF TO A MAXIMUM OF 75ºF. UNOCCUPIED COOLING SETPOINT SHALL BE EQUAL TO 75ºF AND THE UNOCCUPIED HEATING SETPOINT SHALL BE EQUAL TO 60ºF.

OCCUPIED MODE:

IN THE OCCUPIED MODE, THE TERMINAL UNIT SHALL BE MODULATED BETWEEN MAXIMUM AND MINIMUM AIRFLOWS AS SCHEDULED ON THE DRAWINGS. THE TERMINAL UNIT HEATING WATER CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SPACE TEMPERATURE AT THE OCCUPIED SETPOINT. THE EXHAUST FAN ECM SHALL BE MODULATED BY THE EMS TO MAINTAIN AN OVERALL NEGATIVE PRESSURE OF 0.02 INCHES W.G. (ADJUSTABLE).

UNOCCUPIED MODE:

MINIMUM SUPPLY CFM SHALL BE REDUCED TO BOX CONTROLLABLE MINIMUM. ROOM NEGATIVE PRESSURE SHALL BE MAINTAINED AS IN OCCUPIED MODE.

SETPONTS AND PARAMETERS:

ALL CONTROL BANDS, SETPOINTS, SETPOINT LIMITS, SETPOINT INCREMENT VALUES, SETPOINT DECREMENT VALUES, TIME DELAYS, EQUIPMENT ROTATION SEQUENCES, ALARM LIMITS, AND OTHER PARAMETERS SHALL BE ADJUSTABLE FROM THE EMS. ALL PARAMETERS SHALL BE PROVED BY THE ATC CONTRACTOR TO PROVIDE STABLE CONTROL OF ALL SYSTEMS.

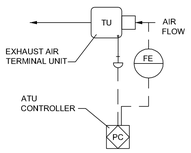
ALARM MONITORING:

AN ALARM WILL BE GENERATED AT THE EMS PC WORKSTATION IF ANY OF THE FOLLOWING OCCUR:
A. DECONTAMINATION ROOM DIFFERENTIAL PRESSURE DROPS BELOW 0.02 INCHES W.G. FOR GREATER THAN 30 SECONDS.

SYSTEM GRAPHIC:

A GRAPHIC REPRESENTATION OF THE SYSTEM SHALL BE PROVIDED AT THE EMS PC OPERATOR WORKSTATION WITH, AT A MINIMUM, ALL POINTS SHOWN ON THE CONTROL DIAGRAM. ANALOG VALUES SHALL BE DISPLAYED WITH DYNAMIC SENSOR DATA UPDATED TO CURRENT SENSED VALUES AT A MAXIMUM OF 20 SECOND INTERVALS. BINARY VALUES WILL UPDATE WITHIN 20 SECONDS OF A CHANGE OF STATE IN THE VALUE. SETPOINTS SHALL BE DISPLAYED ON THE SYSTEMS GRAPHIC AND ALLOW ADJUSTMENT FROM THE SYSTEM GRAPHIC. GRAPHIC WILL BE LINKED TO THE BUILDING FLOOR PLAN GRAPHIC.

2 SEQUENCE OF OPERATION - DECONTAMINATION ROOM
NO SCALE



VAV EXHAUST TERMINAL CONTROL SEQUENCE

THE ATU CONTROLLER SHALL MODULATE THE EXHAUST AIR TERMINAL UNIT CONTROL DAMPER TO MAINTAIN EXHAUST CFM THROUGH THE EXHAUST TERMINAL AS DETERMINED BY THE EMS.

ALARM MONITORING:

AN ALARM WILL BE GENERATED AT THE EMS PC WORKSTATION IF ANY OF THE FOLLOWING OCCUR:
A. FAILURE TO MAINTAIN REQUIRED EXHAUST RATE FOR MORE THAN 30 SECONDS (ADJUSTABLE).

SYSTEM GRAPHIC:

A GRAPHIC REPRESENTATION OF THE SYSTEM SHALL BE PROVIDED AT THE EMS PC OPERATOR WORKSTATION WITH, AT A MINIMUM, ALL POINTS SHOWN ON THE CONTROL DIAGRAM. ANALOG VALUES SHALL BE DISPLAYED WITH DYNAMIC SENSOR DATA UPDATED TO CURRENT SENSED VALUES AT A MAXIMUM OF 20 SECOND INTERVALS. BINARY VALUES WILL UPDATE WITHIN 20 SECONDS OF A CHANGE OF STATE IN THE VALUE. SETPOINTS SHALL BE DISPLAYED ON THE SYSTEMS GRAPHIC AND ALLOW ADJUSTMENT FROM THE SYSTEM GRAPHIC. GRAPHIC WILL BE LINKED TO THE BUILDING FLOOR PLAN GRAPHIC.

2 VARIABLE AIR VOLUME EXHAUST TERMINAL CONTROL DIAGRAM
NO SCALE

CONSTRUCTION DOCUMENTS SUBMISSION
FULLY SPRINKLERED

Revisions: | Date

CONSULTANTS:

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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9395 CHRISTOPHER R. BORNÉ
08-06-2014

ARCHITECT/ENGINEERS:

BES DESIGN/BUILD, LLC
766 Middle St, Fairhope, AL 36532
Phone: 251.990.5778
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Drawing Title: HVAC CONTROLS PLAN

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**
Building Number: 1
Drawing Number: MH704
Dwg. **109** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM
Department of Veterans Affairs

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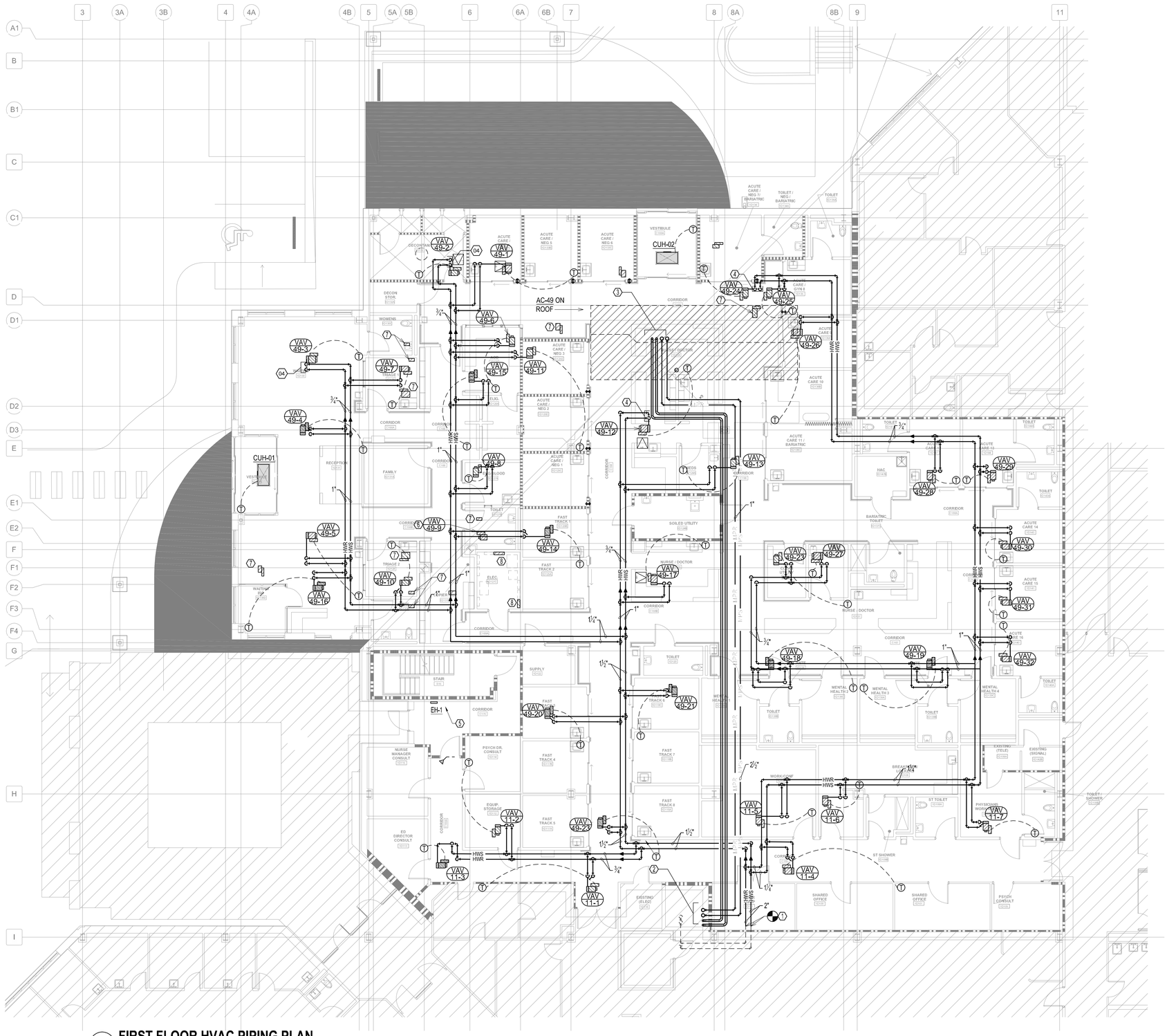


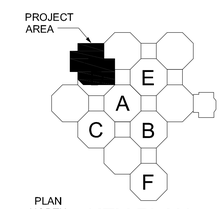
1 **FIRST FLOOR HVAC PIPING PLAN**
1/8"=1'-0"

GENERAL NOTES:

1. SEE SHEET MI001 FOR GENERAL NOTES.
2. RUN OUTS TO VAV BOX HEATING COILS SHALL BE ¾" UNLESS OTHERWISE NOTED.

KEY NOTES:

1. CONNECT TO EXISTING 2" HSW/HWR.
2. 4" CHS/CHR, 2½" MPS, 1" MPR UP TO THIRD FLOOR MECHANICAL ROOM. SEE SHEET MH105 FOR CONTINUATION.
3. 4" CHS/CHR, 2½" MPS, 1" MPR UP TO AC-49 ON ROOF.
4. PROVIDE 3-WAY HEATING COIL CONTROL VALVE FOR END OF RUN BYPASS.
5. THERMOSTAT INTEGRAL WITH ELECTRIC WALL HEATER.
6. COOLING ONLY VAV BOX.
7. EXHAUST TERMINAL.
8. ENCLOSURES FOR BUILDING AUTOMATION SYSTEM CONTROLS AND CONTROL POWER TRANSFORMERS. PROVIDE 120/1Ø POWER TO EACH LOCATION.



0 4' 8' 16'
SCALE: 1/8" = 1'-0"

PLAN NORTH

KEY PLAN
EDMH F.F.E.: 398.00'
PROJECT AREA: 17,075 S.F.

CONSTRUCTION DOCUMENTS SUBMISSION
FULLY SPRINKLERED

Revisions: Date

CONSULTANTS:

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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9395 CHRISTOPHER R. BORNÉ
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Drawing Title: FIRST FLOOR HVAC PIPING PLAN

Approved: Project Director

Project Title: **EMERGENCY DEPARTMENT MENTAL HEALTH IMPROVEMENTS**

Location: **LITTLE ROCK, ARKANSAS**

Date: **2015.03.06** | Drawn: THOMAS | Checked: BORNÉ

Project Number: **CSI-112**
Building Number: 1
Drawing Number: MP101
Dwg. **110** of **127**

CENTRAL ARKANSAS VETERANS AFFAIRS HEALTHCARE SYSTEM

Department of Veterans Affairs

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